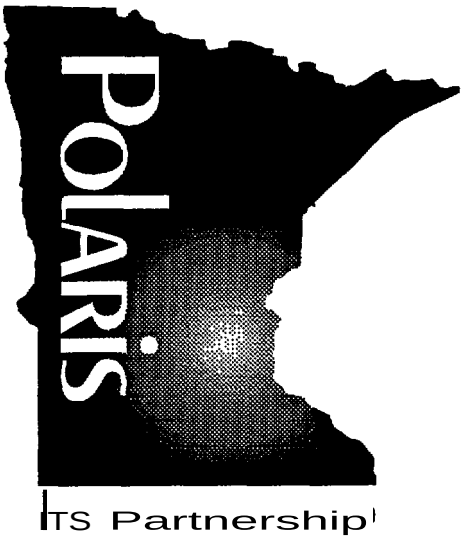
Minnesota Department of Transportation Agreement Number: 73807P

Minnesota Intelligent Transportation Systems

ITS System Specification

APPENDIX C: Data Flows by Function for ITS Services



Prepared for the Minnesota Department of Transportation by:

Lockheed Martin Federal Systems
Intelligent Transportation Systems
Mail Drop 0124
1801 State Route 17C
Owego, New York 13827-3998

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Account Management (AM) provides the capability for users to maintain travel services account information including personal profiles. It also establishes fees for transportation services and tracks billing and payments for services used.

Figure 64 and Figure 65 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

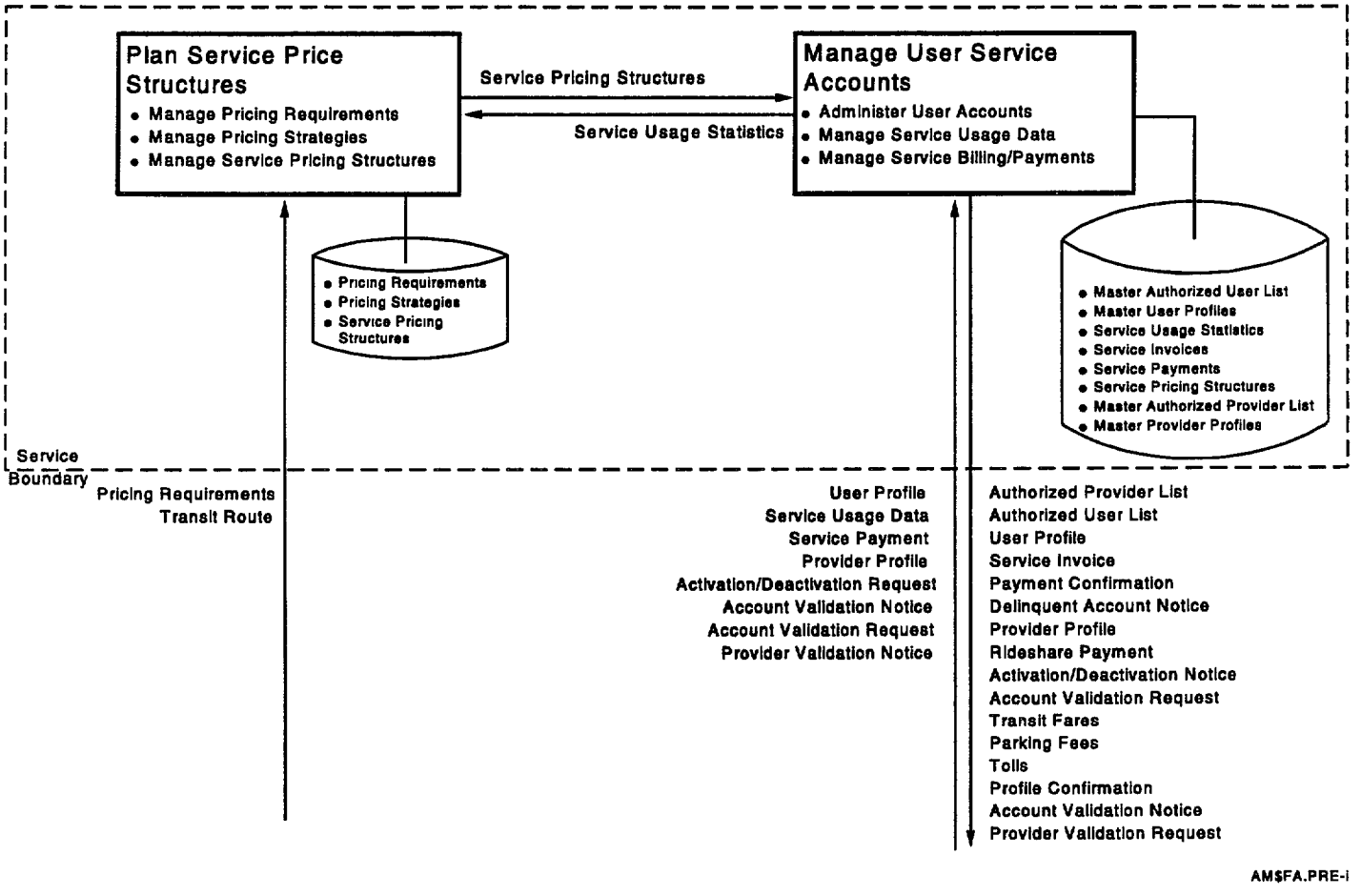

Figure 64. Account Management - Functional Architecture

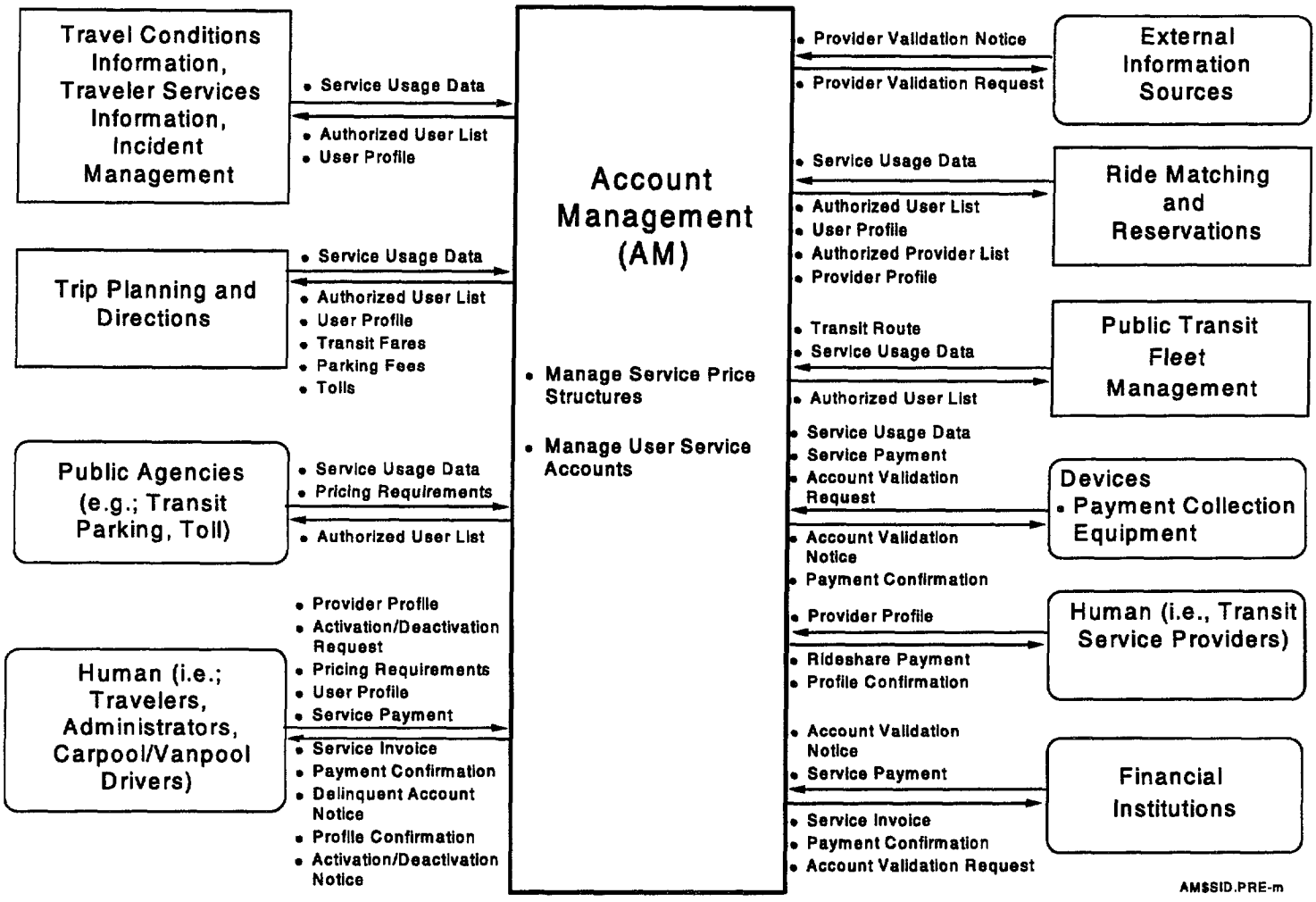

Figure 65. Account Management - Service Interface Diagram

Account Management - Plan Service Price Structures - Inputs

Input Data Name	Definition	Source
Pricing Requirements	Consists of requirements for pricing transportation services.	Human (External Interface)
Pricing Requirements	Consists of requirements for pricing transportation services.	Public Agencies (i.e. Parking, toll) (External Interface)
Service Usage Statistics	consists of information about the amount of usage for each transportation Service	Manage User Service Accounts (Function)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Public Transit Fleet Management (Service)

Account Management Service - Plan Service Price Structures - Outputs

Output Data Name	Definition	Destination
Service Pricing Structures	consists of information about the rates charged for various transportation services (including ATIS servces).	Manage User Service Accounts (Function)

Account Management - Manage User Service Accounts - Inputs

Input Data Name	Definition	Source
Account Validation Notice	consists of a confirmation that a user's bank account or credit card number is correct and valid.	Financial Institutions (External Interface)
Account Validation Request	consists of a request to determine the validity of a user's bank account or credit card number	Devices(i.e., payment (collection equipment) (External Interface)
Activation/Deactivation Request	consists of a request for activation/deactivation of an entire ATIS service or a redeshare provider profile	Human and Administrators (External Interface)
Provider Profile	consists of information specific to a rideshare provider that uniquely identifies that provider and the services they provide. This data includes vehicle license plate number, vehicle make, vehicle color, driver ID. safety certification information	Human (i.e., Transit Serivce Providers) (External Interface)
Provider Profile	consists of information specific to a rideshare provider that uniquely identifies 'that provider and the services they provide. This data includes vehicle license plate number, vehicle make, vehicle color, driver ID, safety certification information	Human (i.e., Vanpool/Carpool Drivers) (External Interface)
Provider Validation Notice	consists of a confirmation that a provider's profile information is correct and valid.	External information Source(s) (External Interface)
Service Payment	consists of payments for parking, tolls, transit fares, traveler information services.	Devices(i.e., payment (collection equipment) (External Interface)
Service Payment	consists of payments for parking, tolls, transit fares, traveler information services.	Financial Institutions (External Interface)
Service Payment	consists of payments for parking, tolls, transit fares, traveler information services.	Human (External Interface)
Service Pricing Structures	consists of information about the rates charged for various transportation services (including ATIS services).	Plan Service Price Structures (Function)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Traveler Services Information (Service)
Service Usage Data -1	consists of data required to generate a users service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Ride Matching and Reservations (Service)
Service Usage Data-1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Incident Management (Service)

Input Data Name	Definition	Source
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Public Transit Fleet Management (Service)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Travel Conditions Information (Service)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Devices (i.e., payment collection equipment) (External Interface)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and #destination, departure and arrival time, vehicle % full at stop, (continued)	Public Agencies (i.e. Parking, toll (External Interface)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Trip Planning and Directions (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Devices (i.e., payment collection equipment) (External Interface)
Service Usage Data -2	((continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Incident Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Public Agencies (i.e. Parking, toll) (External Interface)
Service Usage Data -2	(continued number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Public Transit Fleet Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lii use at stop.	Ride Matching and Reservations (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Travel Conditions Information (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Traveler Services Information (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Trip Planning and Directions ! (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Human (External Interface

Account Management Service - Manage User Service Accounts - Outputs

Output Data Name	Definition	Destination
Account Validation Notice	consists of a confirmation that a user' s bank account or credit card number is correct andvalid	Devices(i.e., payment (collection equipment) (External Interface)
Account Validation Request	consists of a request to determine the validity of a user's bank account or credit card number.	Financial Institutions (External Interface)
Activation/Deactivation Notice	consists of a notice of activation/deactivation of an entire ATIS service or service profile or a rideshare service provider profile.	Human (i.e., Administrators, Travelers) (External Interface)
Authorized Provider List	consists of a list of authorized rideshare providers.	Ride Matching and Reservations (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Incident Management (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Public Agencies (ie. parking, toll) (External Interface)
Authorized User List	consists of a list of authorized users for the specified service.	Public Transit Fleet Management (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Ride Matching and Reservations (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Travel Conditions Information (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Traveler Services Information (Service)
Authorized User List	consists of a list of authorized users for the specified service.	Trip Planning and Directions (Service)
Delinquent Account Notice	consists of a notice pertaining to overdue accounts.	Human (i.e, Travelers, Transit Service Prov.) (External Internal)
Parking Fees	consists of the specific prices charged for parking services.	Trip Planning and Directions (Service)

Output Data Name	Definition	Destination
Payment onfirmation	consists of an acknowledgement that payment was received.	Devices (i.e., payment collection equipment) (External Interface)
Payment Confirmation	consists of an acknowledgement that payment was received.	Financial Institutions (External Interface)
Payment Confirmation	consists of an acknowledgement that payment was received.	Human (i.e.Travlers, Transit Service Prov.) (External interface)
Profile Confirmation	consists of an acknowledgement that profile information has been received and processed.	Human (i.e., Carpool/Vanpool Drivers) (External Interface)
Profile Confirmation	consists of an acknowledgement that profile information has been received and processed.	Human (i.e., Transit Service Providers) (External Interface)
Provider Profile	consists of information specific to a rideshare provider that uniquely identifies that provider and the services they provide. This data includes vehicle license plate number, vehicle make, vehicle color, driver ID, safety certification information	Ride Matching and Reservations (Service)
Provider Validation Request	consists of a request to determine if the profile information given by the provider participating in the Ride Matching and Reservations Service is correct and true (e.g., drivers license, driver criminal history, moving violations proper certifications).	External Information Source(s) (External Interface)
Rideshare Payment	consists of payment to a rideshare provider for services rendered.	Human (i.e., Transit Service Providers) (External Interface)
Service Invoice	consists of a detailed list of services rendered and associated cost.	Financial Institutions (External Interface)
Service Invoice	consists of a detailed list of services rendered and associated cost.	Human (i.e., Travelers) (External Interface) .
Service Usage Statistics	consists of information about the amount of usage for each transportation service.	Plan Service Price Structures (Function)
Tolls	consist of the specific prices charged for use of a roadway	Trip Planning and Directions (Service)
Transit Fares	consists of the specific prices charged for transit services	Trip Planning and Directions (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Incident Management (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Ride Matching and Reservations (Service)

Output Data Name	Definition	Destination
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Travel Conditions Information (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Traveler Services Information (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Trip Planning and Directions (Service)

Incident Management (IM) provides the capability to detect and acknowledge reported incidents and travel emergencies. This service provides for coordinated multi-jurisdictional incident response via preplanned action plans and procedures. Emergency resources (vehicles, personnel and equipment) are assigned based on incident response needs and available resources. This service also provides for real-time monitoring, recording and reporting of incident information and response status.

Figure 66 and Figure 67 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

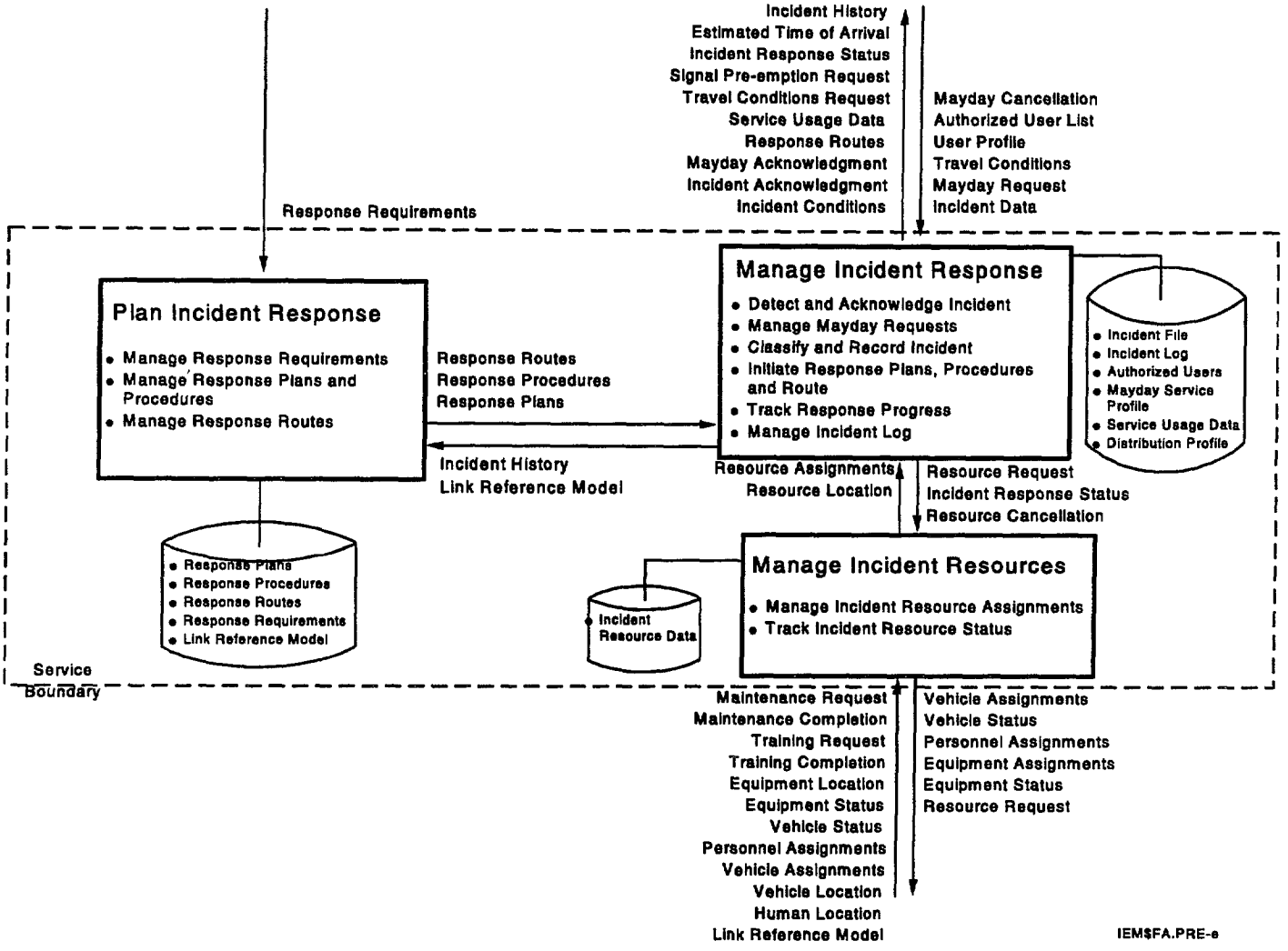

Figure 66. Incident Management - Functional Architecture

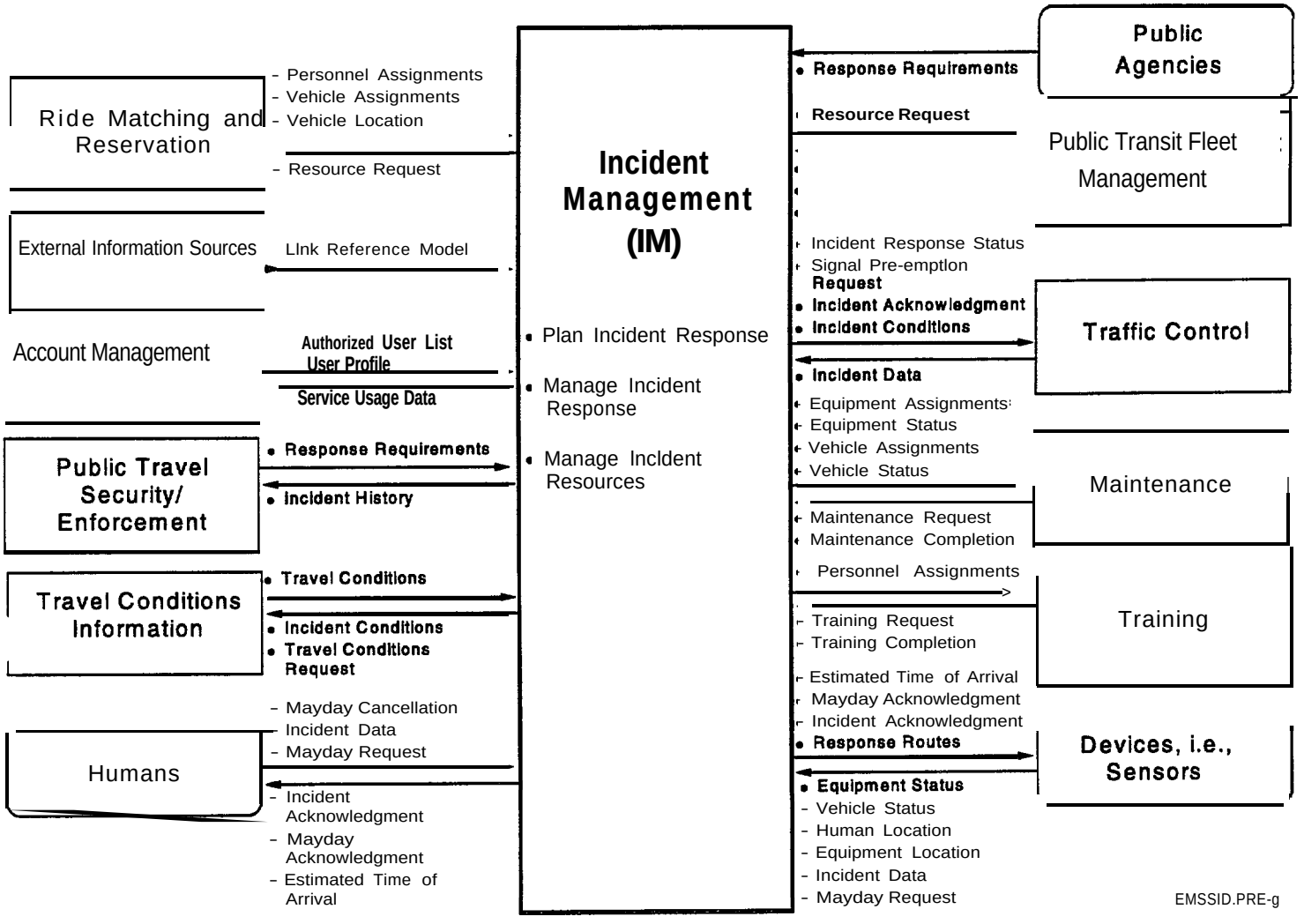

Figure 67. Incident Management - Service Interface Diagram

Incident Management - Plan Incident Response - Inputs

Input Data Name	Definition	Source
Incident History	Historical data describing an Incident or series of incidents. Data is obtained from incident report, incident files, and the incident log.	Manage Incident Response (Function)
Link Reference Model	a map containing all the fundamental geographic features and location reference information required for, and from which, other maps showing specialized information can be prepared.	Manage Incident Response (Function)
Response Requirements	consists of the definition of the needs of the various providers and users of iincident management services	Public Agencies/Private Agencies, Citizens (External Interface)
Response Requirements	consists of the definition of the needs of the various providers and users of incident management services	Public Travel Security/Enforcement (Service)

Incident Management - Plan Incident Response - Outputs

Output Data Name	Definition	Destination
Response Plans	consists of a definition of the resources required to respond to a specific incident	Manage Incident Response (Function)
Response Procedures	consists of a definition of the actions that need to be performed to resolve a specific type of incident.	Manage Incident Response (Function)
Response Routes	consists of routes that allow assigned incident resources to reach an incident location in a minimal amount of time	Manage incident Response (Function)

Incident Management - Manage Incident Response - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for the specified service.	Account-Management (Service)
Incident Data	consists of information that is collected about an incident but may not be organized or stored in a repository. (e.g. incident location, type of incident and temestamp	Devices (i.e. sensors) (External Interface)
Incident Data	consists of information that is collected about an incident but may not be organized or stored in a repository. (e.g. incident location, type of incident and Itimestamp)	Humans (External Interface)
Incident Data	consists of information that is collected about an incident but may not be organized or stored in a repository. (e.g. incident location, type of incident and timestamp	Traffic Control (Service)
Mayday Cancellation	consists of a termination of a Mayday request for service	Humans (External Interface)
Mayday Request	consists of a call for assistance	Devices(i.e., sensors) (External Interface)
Mayday Request	consists of a call for assistance	Humans (External Interface)
Resource Assignments	consist of the allocation of vehicles, equipment, and personnel to incidents, maintenance training, or availablity status	Manage Incident Resources (Function)
Resource Location	consist of the location of vehicles, equipment and personnel	Manage Incident Resources (Function)
Response Plans	consists of a definition of the resources required to respond to a specific Incident.	Plan Incident Response (Function)
Response Procedures	consists of a definition of the actions that need to be performed to resolve a specific type of incident.	Plan Incident Response (Function)
Response Routes	consists of routes that allow assigned incident resources to reach an incident location in a minimal amount of time	Plan Incident Response (Function)
Travel Conditions	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)

Input Data Name	Definition	Source
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Travel Conditions Information (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Account Management (Service)

Incident Management - Manage Incident Response - Outputs

Output Data Name	Definition	Destination
Estimated Time of Arrival	consists of the projected time that resources will arrive &the incident location.	Devices (i.e., Sensors) (External Interface)
Estimated Time of Arrival	consists of the projected time that resources will arrive at the incident location.	Humans (External Interface)
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Devices (i.e., Sensors) (External Interface)
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Humans (External Interface)
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Traffic Control (Service)
Incident Conditions	consists of stored information applicable to an active incident that has impact ton current travel conditions	Traffic Control (Service)
Incident Conditions	consists of stored information-applicable to an active incident that has impact on current travel conditions	Travel Conditions Information (Service)
Incident History	Historical data describing an incident or series of incidents. Data is obtained Ifrom incident report, incident files, and the incident log.	Plan Incident Response (Function)
Incident History	Historical data describing an incident or series of incidents. Data is obtained from incident report, incident files, and the incident log.	Public Travel Security/Enforcement (Service)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Manage Incident Resources (Function)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Traffic Control (Service)
Link Reference Model	consists of a commonly defined set of point, linear, and area geographical locations, such as roadway links, which ITS systems use to share geographical information between themselves.	Plan Incident Response (Function)
Mayday Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Devices (i.e., sensors) (External Interface)

Output Data Name	Definition	Destination
Mayday Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Humans (External Interface)
Resource Cancellation	consists of the reassignment of vehicles, equipment and personnel from an assigned task that is no longer required.	Manage Incident Resources (Function)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident	Manage Incident Resources (Function)
Response Routes	consists of routes that allow assigned incident resources to reach an incident location in a minimal amount of time	Devices (i.e., sensors) (External Interface)
Service Usage Data -1	consists of data required to generate a user's service invoice for services-rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Account Management (Service)
Signal Pre - emption Request	is a request from emergency vehicle(s) for immediate pre-emption of lintersection traffic signals. An emergency pre-emption request interrupts ltraff ic signal timing plans to accommodate safe passage of the emergency vehicles.	Traffic Control (Service)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Travel Condtjons Information (Service)

Incident Management - Manage Incident Resources - Inputs

Input Data Name	Definition	Source
Equipment Location	consists of the location of the equipment	Devices (i.e., sensors) (External Interface)
Equipment Status	consists of the accumulated hours of usage and operator reported problems	Devices (i.e., sensors) (External Interface)
Human Location	consists of the location of people.	Devices (i.e., sensors) (External Interface)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Manage Incident Response (Function)
Link Reference Model	a map containing all the fundamental geographic features and location reference Information required for, and from which, other maps showing specialized information can be prepared.	External Information Sources (External Interface)
Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Maintenance (Service)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Maintenance (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Public Transit Fleet Management (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-raining assignments.	Ride Matching and Reservations (Service)
esource Cancellation	consists of the reassignment of vehicles, equipment and personnel from an assigned task that is no longer required.	Manage Incident Response (Function)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident.	Manage Incident Response (Function)
Training Completion	consists of identification of transit resources that have completed identified training.	Training (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Training (Service)

Input Data Name	Definition	Source
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Public Transit Fleet Management (Service)
Vehicle Asssignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Ride Matching and Reservations (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Public Transit Fleet Management (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Ride Matching and Reservations (Service)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Devices (i.e., sensors) (External Interface)

Incident Management - Manage Incident Resources - Outputs

Output Data Name	Definition	Destination
Equipment Assignments	consists of the assigment of equipment to vehicles, facilities, personnel, incidents, maintenance, training	Maintenance (Service)
Equipment Status	consists of the accumulated hours of usage and operator reported problems	Maintenance (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to training assignments.	Training (Service)
Resource Assignments	consist of the allocation of vehicles, equipment, and personnel to incidents, maintenance, training, or availability status	Manage Incident Response (Function)
Resource Location	consist of the location of vehicles, equipment and personnel	Manage Incident Response (Function)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident.	Public Transit Fleet Management (Service)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident.	Ride Matching and Reservations (Service)
Vehicle Assignments	consists of assignment of vehicles to facilities, jurisdictions, personnel, incidents, maintenance, training or available.	Maintenance (Service)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Maintenance (Service)

Maintenance (MNT) compares vehicle mileage and other vehicle condition data with preventative maintenance schedules to develop a prioritized list of maintenance tasks. Personnel availability and skill levels are then compared to the prioritized and unscheduled (i.e. vehicle breakdown) maintenance tasks to a) assign mechanics to vehicle maintenance tasks, and b) request vehicles be assigned to a maintenance garage. Vehicle maintenance and condition history information is maintained to assist the mechanic in performing maintenance tasks.

Figure 68 and Figure 69 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

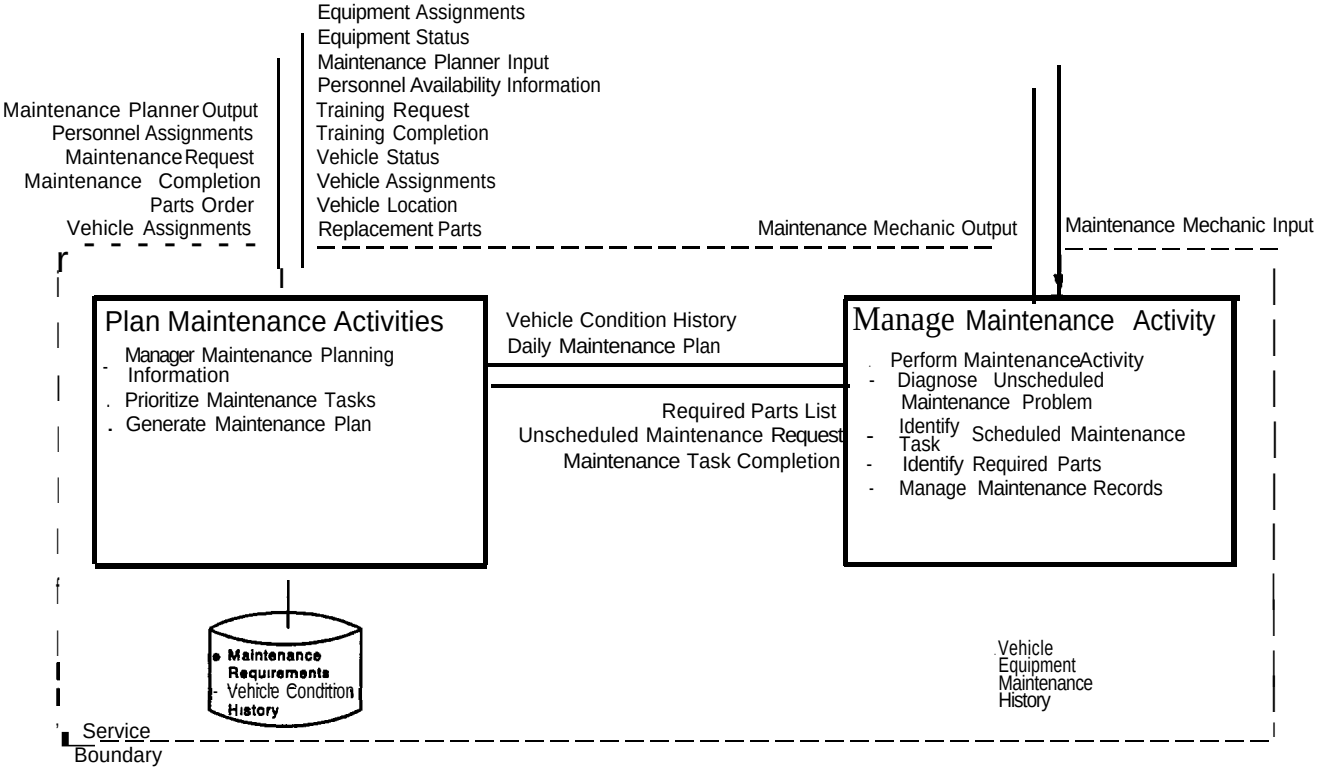

Figure 68. Maintenance - Functional Architecture

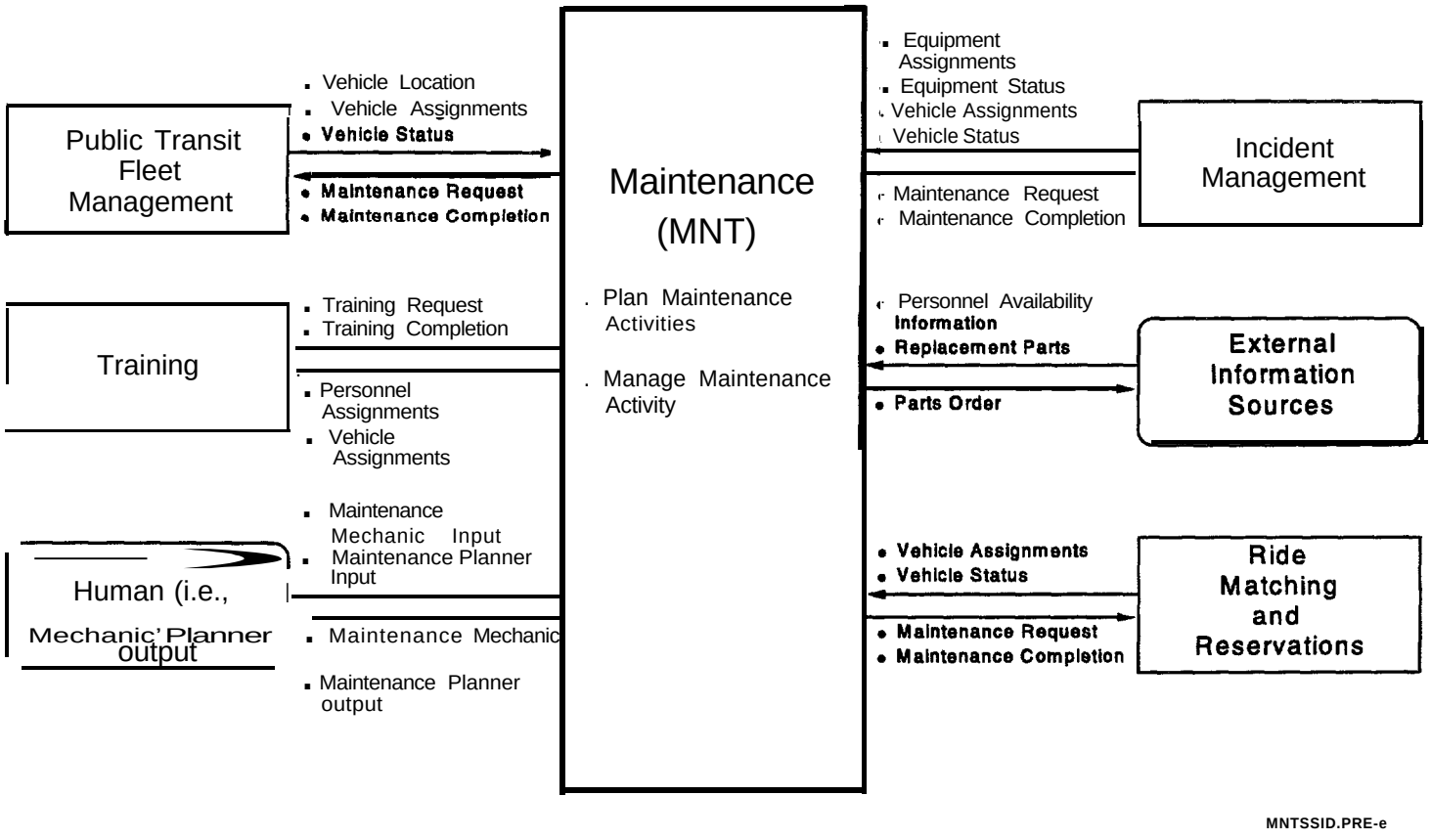

Figure 69. Maintenance - Service Interface Diagram

Maintenance - Plan Maintenance Activities - Inputs

Input Data Name	Definition	Source
Equipment Assignments	consists of the assigment of equipment to vehicles, facilities, personnel, incidents, maintenance, training	Incident Management (Service)
Equipment Status	consists of the accumulated hours of usage and operator reported problems	Incident Management (Service)
Maintenance Planner Input		Human (External Interface)
Maintenance Task Completion		Manage Maintenance Activities (Function)
Personnel Availability Information	consists of transit personnel available for assignments	External Information Sources (External Interface)
Replacements Parts		External Information Sources (External Interface)
Required Parts List		Manage Maintenance Activities (Function)
Training Completion	consists of identification of transit resources that have completed identified training.	Training (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Training (Service)
Unscheduled maintenance Request		Manage Maintenance Activities (Function)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Incident Management (Service)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Public Transit Fleet Management (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Public Transit Fleet Management (Service)

Input Data Name	Definition	Source
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Incident Management (Service)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Public Transit Fleet Management (Service)

Maintenance - Plan Maintenance Activities - Outputs

Output Data Name	Definition	Destination
Daily Maintenance Plan	TBD	Manage Maintenance Activities (Function)
Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Incident Management (Service)
Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Public Transit Fleet Management (Service)
Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Ride Matching and Reservations (Service)
Maintenance Planner Output		Human (External Interface)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Incident Management (Service)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Public Transit Fleet Management (Service)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Ride Matching and Reservations (Service)
Parts Order		External Information Sources (External Interface)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Training (Service)
Vehicle Assignments	consists of assignment of vehicles to facilities, jurisdictions, personnel, incidents, maintenance, training or available.	Training (Service)
Vehicle Condition History		Manage Maintenance Activities (Function)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Ride Matching and Reservations (Service)

Maintenance - Manage Maintenance Activities - Inputs

Input Data Name	Definition	Source
Daily Maintenance Plan	TBD	Plan Maintenance Activities (Function)
Maintenance Mechanic Input		Human (External Interface)
Vehicle Condition History		Plan Maintenance Activities (Function)

Maintenance - Manage Maintenance Activities - Outputs

Output Data Name	Definition	Destination
Maintenance Mechanic Output		Human (External Interface)
Maintenance Task Completion		Plan Maintenance Activities (Function)
Required Parts List		Plan Maintenance Activities (Function)
Unscheduled Maintenance Request		Plan Maintenance Activities (Function)

Public Transit Fleet Management (TFM) monitors real-time schedule adherence of public transit vehicles, and provides assistance in getting transit vehicles back on schedule when schedule deviations occur. This service also develops transit routes and schedules, dispatches vehicles, allocates drivers to vehicles and routes, provides real-time guidance directions to drivers of transit vehicles when needed, and monitors vehicle systems.

Figure 70 and Figure 71 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

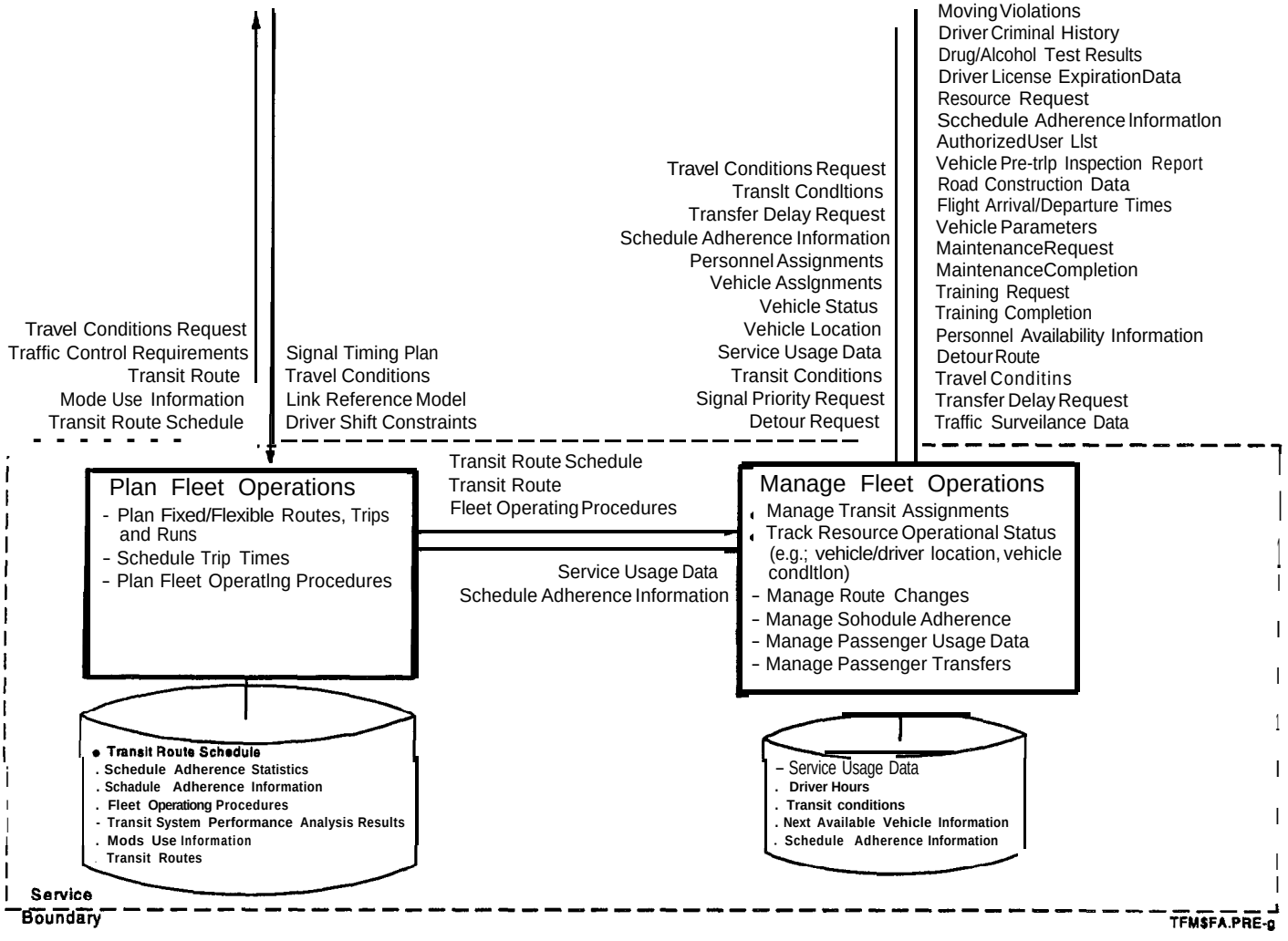

Figure 70. Public Transit Fleet Management - Functional Architecture

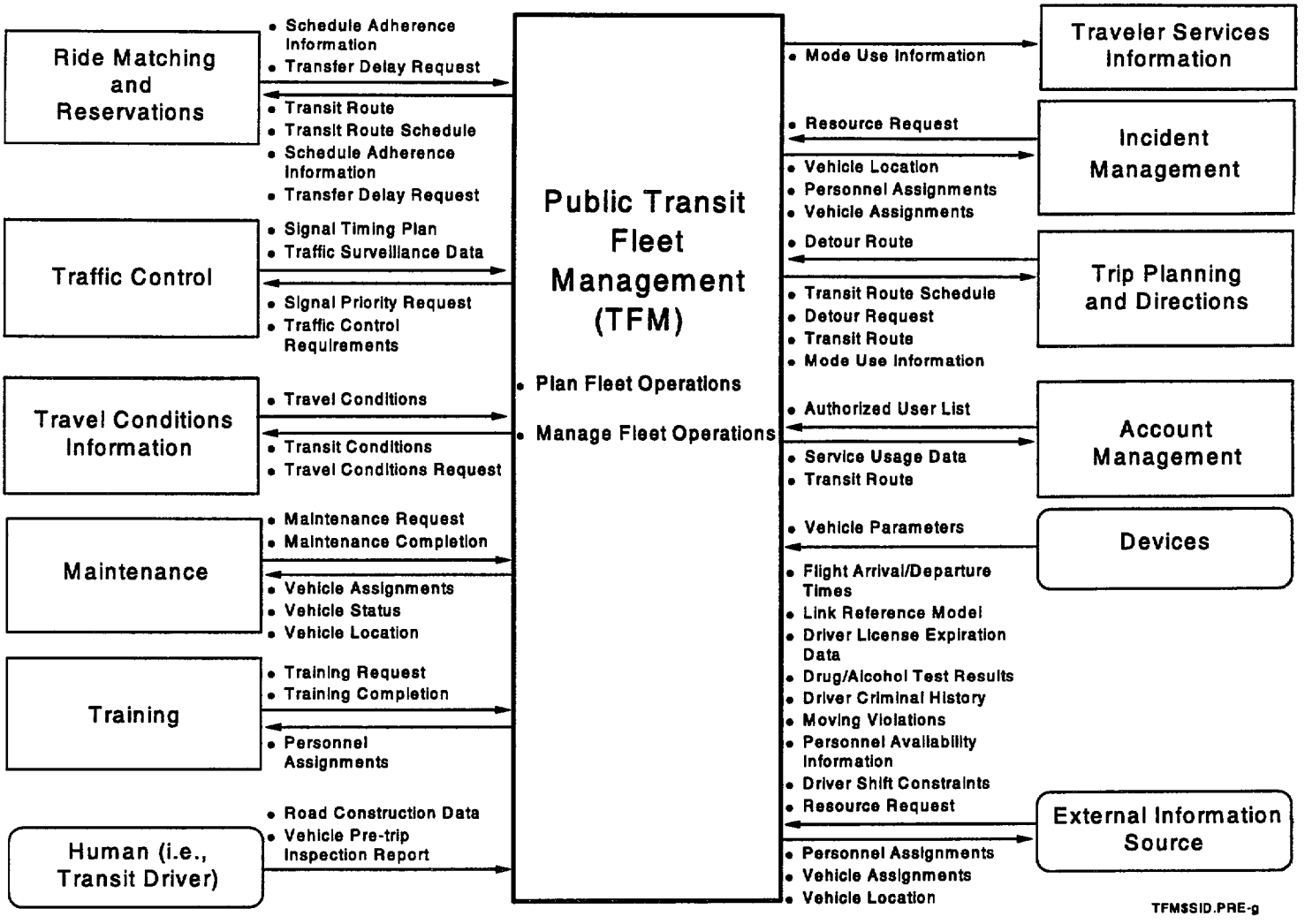

Figure 71. Public Transit Fleet Management - Service Interface Diagram

Public Transit Fleet Management - Plan Fleet Operations - Inputs

Input Data Name	Definition	Source
Driver Shift Constraints	consists of information about driver's schedule preference, seniority, and garage assignment.	External Information (Sources (External Interface)
Link Reference Model	a map containing all the fundamental geographic features and location reference information required for, and from which, other maps showing specialized information can be prepared.	External Information Sources (External Interface)
Schedule Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arrival time and transit stop departure time.	Manage Fleet Operations (Function)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as Well as overall transit resource statistics, including trip origin and idestination, departure and arrival time, vehicle % full at stop, (continued)	Manage Fleet Operations (Function)
Service Usage Data -2	(continued) number-of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Manage Fleet Operations (Function)
Signal Timing Plan	consists of the implemented traffic control strategy in the form of a timing algorithm (cycle split, offset, etc)	Traffic Control (Service)
Travel Conditions - 1	consists of current/forecst information about traff ic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)
Travel Conditions - 2	(continued) and weather that is customized to a user's specified trip and mode(s)	Travel Conditions Information (Service)

Public Transit Fleet Management - Plan Fleet Operations - Outputs

Output Data Name	Definition	Destination
Fleet Operating Procedures	consists of operational procedures for transit fleet -	Manage Fleet Operations -- (Function)
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc.) such as rules for use, hours of operation, payment methods, etc.	Traveler Services Information (Service)
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc.) such as rules for use, hours of operation, payment methods, etc.	Trip Planning and Directions (Service)
Traffic Control Requirements	consists of specific traffic requirements that affect a traffic segment within a particular geographic area. (e.g. quitting time of a large business along a specific roadway.)	Traffic Control (Service)
'Transit Route	consists of Fixed Routes and Flexible Routes information.	Account Management (Service)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Manage Fleet Operations (Function)
Transit Route	consists Fixed Routes and-Flexible Routes information.	Ride Matching and Reservations (Service)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Trip Planning and Directions (Service)
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Manage Fleet Operations (Function)
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Ride Matching and Reservations (Service)
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Trip Planning and Directions (Service)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Travel Conditions Information (Service)

Public Transit Fleet Management - Manage Fleet Operations - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for the specified service.	Account Management (Service)
Detour Route	consists of an alternate route between an origin and destination, Used to route a vehicle around incidents/congestion, or to route a rideshare vehicle to pick up an additional customer.	Trip Planning and Directions (Service)
Driver Criminal History	consists of transit personnel criminal history	External Information Sources (External Interface)
Driver License Expiration Data	consists of transit personnel driver license expiration data	External Information Sources (External Interface)
Drug/Alcohol Test Results	consists of transit personnel drug /alcohol test results	External Information Sources (External Interface)
Fleet Operating Procedures	consists of operational procedures for transit fleet	Plan Fleet Operations (Function)
Flight Arrival/Departure Times	consists of airline flight arrival I departure schedules	External Information Sources (External Interface)
[Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Maintenance (Service)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Maintenance (Service)
Moving Violations	consists of transit personnel moving violations history	External Information Sources (External Interface)
Personnel Availability Information	consists of transit personnel available for assignments	External Information Sources (External Interface)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident	External Information Sources (External Interface)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an inciden	Incident Management (Service)

Input Data Name	Definition	Source
Road Construction Data	consists of transit vehicle report of witnessed significant road construction information.	Human (External Interface)
Schedule (Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arriva time and transit stop departure time.	Ride Matching and Reservations (Service)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a pre-defined geographic location (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Traffic Control (Service)
Training Completion	consists of identification of transit resources that have completed identifie training.	Training (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Training (Service)
Transfer Delay Request	consists of an inter-agency request to delay departure of a connecting vehicle to assist transfer when the originating vehicle is late.	Ride Matching and Reservations (Service)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Plan Fleet Operations (Function)
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Plan Fleet Operations (Function)
Travel Conditions-1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)
Travel Conditions - 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Travel Conditions Information (Service)
Vehicle Parameters	consists of raw (i.e. unsensed) environmental conditions associated with the vehicle (e.g. engine temp, door open/closed, vehicle position, velocity, acceleration, etc.).	Devices (i.e. video, radar, detectors) (External Interface)
Vehicle Pre-Trip Inspection Report	consists of transit vehicle pre-trip inspection results	Human (External Interface)

Public Transit Fleet Management - Manage Fleet Operations - Outputs

Output Data Name	Definition	Destination
Detour Request	is a request to provide an alternate route between two transit stops.	Trip Planning and Directions (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	External Information Source(s)(External interface
Personnel Assignments	consists of driver-to-run, driver-to-incident,~super&or-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Incident Management (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Training (Service)
Schedule Adherence Information	consists information describing fleet schedule adherence - indicating route segment running time, transit stop arriva time andtransit stop departure time.	Plan Fleet Operations (Function)
Schedule Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arriva time and transit stop departure time.	Ride Matching and Reservations (Service)
Service Usage Data-1	consists of data required to generate a user' s service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data-1	consistsof data required to generate a users service invoice for services (rendered as well as overall transit resource statistics, including trip origin and Idestination, departure and arrival time, vehicle % full at stop, (continued)	Plan Fleet Operations (Function)
Service Usage Data-2	(continued) number of passengers entering and exiting vehicle at stop, paymentmethod, fare type, vehicle dwell time at stop, and wheel chair lii use at stop.	Account Management (Service)
Service Usage Data-2	(continued) number of passengers entering and exiting vehicle at stop, paymentmethod, fare type, vehicle dwell time at stop, and wheel chair lii use at stop.	Plan Fleet Operations (Function)
Signal Priority Request	is a request to pre-empt intersection traffic signals. This request enables transit vehicles to return to schedule adherence & is lower in priority than an iemergency vehicle signal preemption request.	Traffic Control (Service)
Transfer Delay Request	consists of an inter-agency request to delay departure of a connecting vehicle to assist transfer when the originating vehicle is late.	Side Matching and qeservations (Service)
Transit Conditions	consists of inform&ton about transit vehicle schedule adherence, rideshare data, and transit provider information including but not limited to vehicle ID, transit stop, estimated vehicle arrival time, estimated vehicle departure time, current schedule.	Travel Conditions Information (Service)

Output Data Name	Definition	Destination
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the's user specific needs (e.g.route, mode, jurisdiction)	Travel Conditions Information (Service)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	External Information Source(s) (External Interface)
Vehicle Assignments	consists of assignment of vehicles to facilities, jurisdictions, personnel, incidents, maintenance, training or available.	Incident Management (Service)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Maintenance (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	External Information Source(s) (External Interface)
Vehicle Location	consists of information that indicates the location of each vehicle.	Incident Management (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Maintenance (Service)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Maintenance (Service)

Public Travel Security/Enforcement (PTSE) provides for the planning and implementation of public travel security policies, plans and procedures such as the establishment of secure areas for public transit riders and the monitoring of public areas for security incidents. The establishment and enforcement of regulations for HOV lanes, railroad crossings and construction work zones, are also provided. Violations records are kept and statistics are analyzed to determine any needed updates to security policies, plans or procedures.

Figure 72 and Figure 73 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

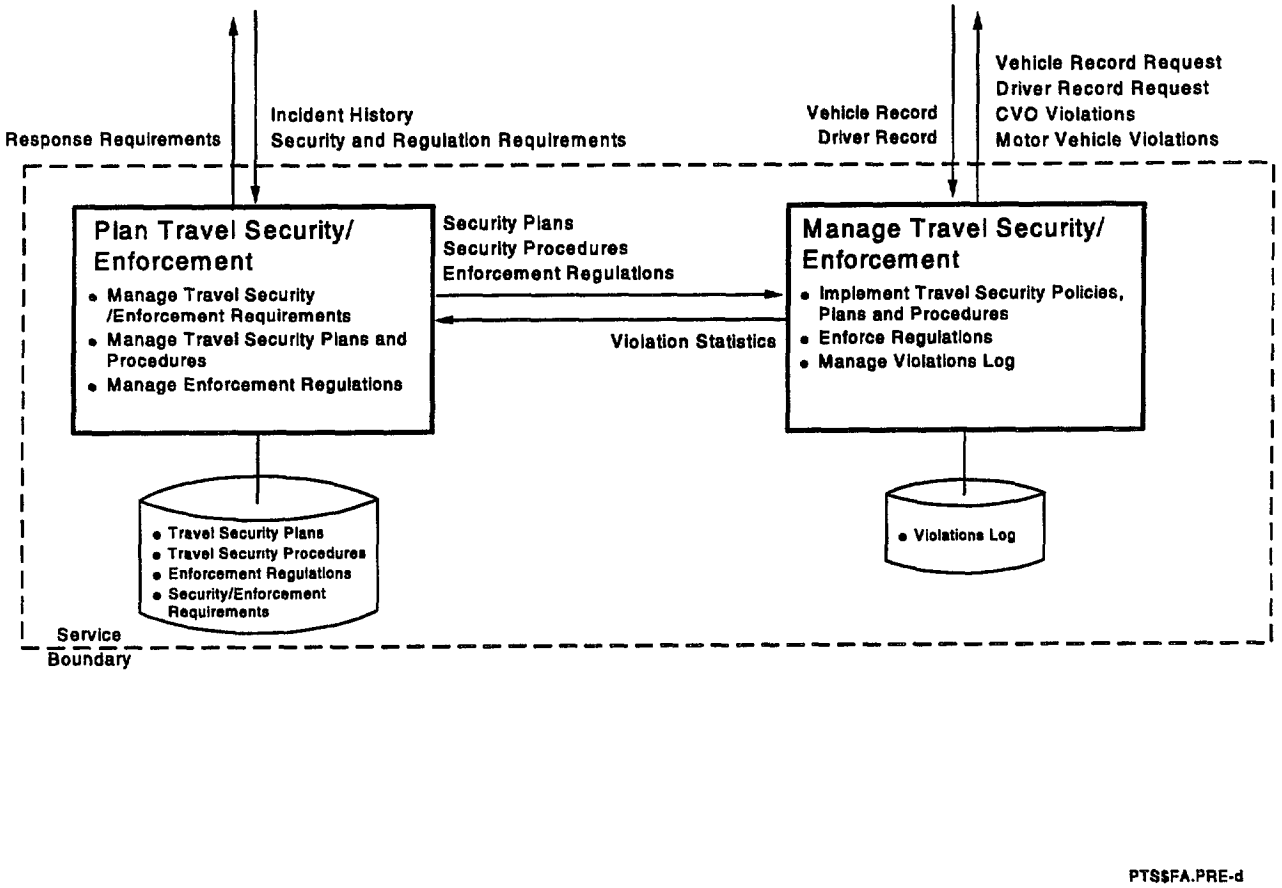

Figure 72. Public Travel Security/Enforcement - Functional Architecture

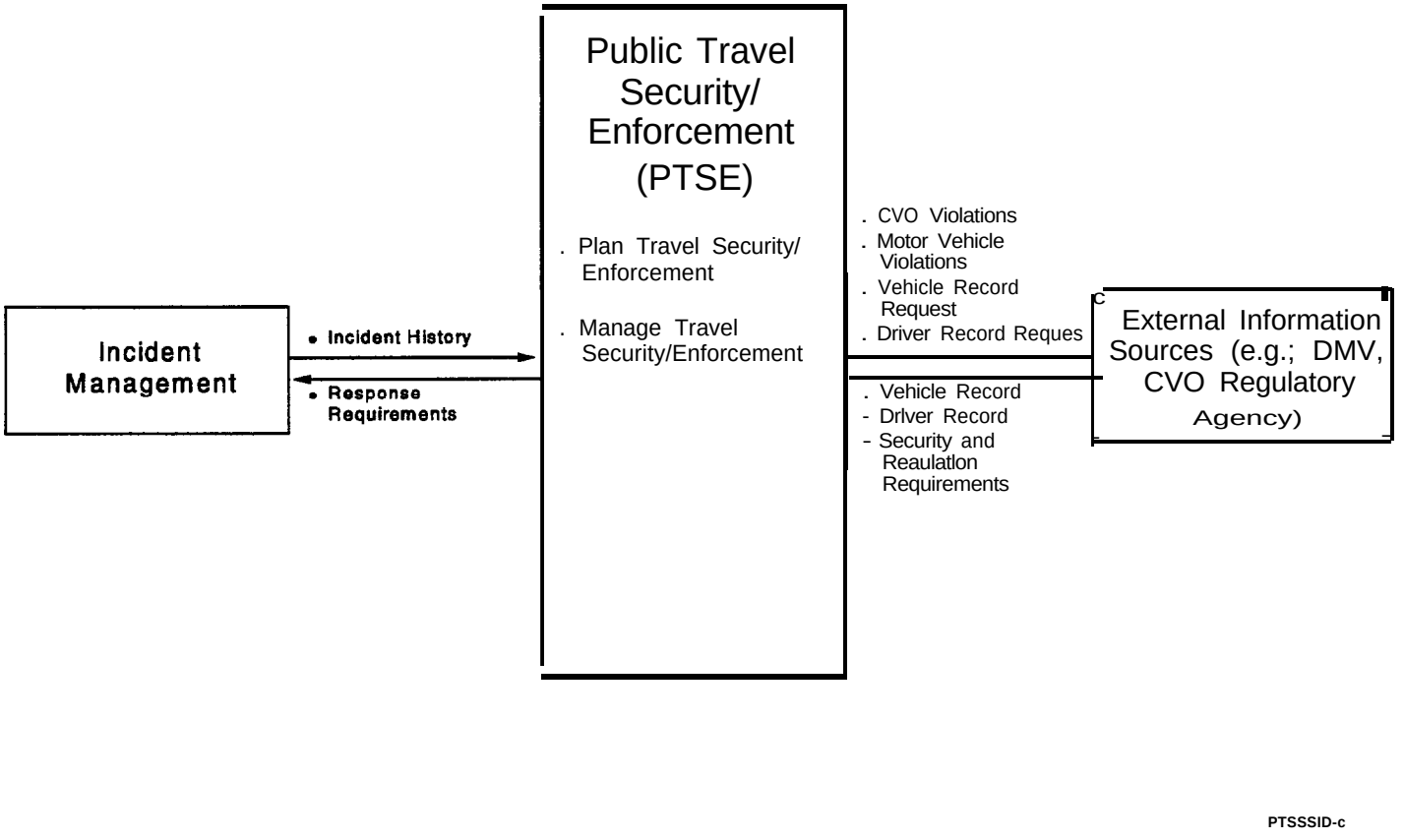

Figure 73. Public Travel Security/Enforcement - Service Interface Diagram

Public Travel Security/Enforcement - Plan Travel/Security Enforcement - Inputs

Input Data Name	Definition	Source
Incident History		Incident Management (Service)
Security and Regulation Requirements		External Information Sources (External Interface)
Violation Statistics		Manage Travel Security/Enforcement (Function)

Public Travel Security/Enforcement - Plan Travel/Security Enforcement - Outputs

Output Data Name	Definition	Destination
Enforcement Regulations		Manage Travel Security/Enforcement (Function)
Response Requirements	consists of the definition of the needs of the various providers and users of incident management services	incident Management (Service)
Security Plans		Manage Travel Security/Enforcement (Function)
Security procedures		Manage Travel Security/Enforcement (Function)

Public Travel Security/Enforcement - Manage Travel/Security Enforcement - Inputs

Input Data Name	Definition	Source
Driver Record		External Information Sources (External Interface)
Enforcement Regulations		Plan Travel Security/Enforcement (Function)
Security Plans		Plan Travel Security/Enforcement (Function)
Security Procedures		Plan Travel Security/Enforcement (Function)
Vehicle Record		External Information Sources (External Interface)

Public Travel Security/Enforcement - Manage Travel/Security Enforcement - Outputs

Output Data Name	Definition	Destination
CVO Violations		External Information Sources (External Interface)
Driver Record Rquest		External Information Sources (External Interface)
Mortor Vehicle Violations		External Information Sources (External Interface)
Vehicle Record Request		External Information Sources (External Interface)
Violation Statistics		Plan Travel Security/Enforcement (Function)

Ride Matching and Reservations (RMR) provides riders with information about rideshare options (such as express bus, car pool, vanpool, paratransit or other specialized service), based on user-specified criteria (such as date/time of pick-up/drop-off, origin, destination, and specific restrictions and preferences). This service provides real-time matching of rider needs with services available from providers, and it provides riders with the capability to reserve rides in advance or in real-time when additional capacity is available.

Figure 74 and Figure 75 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

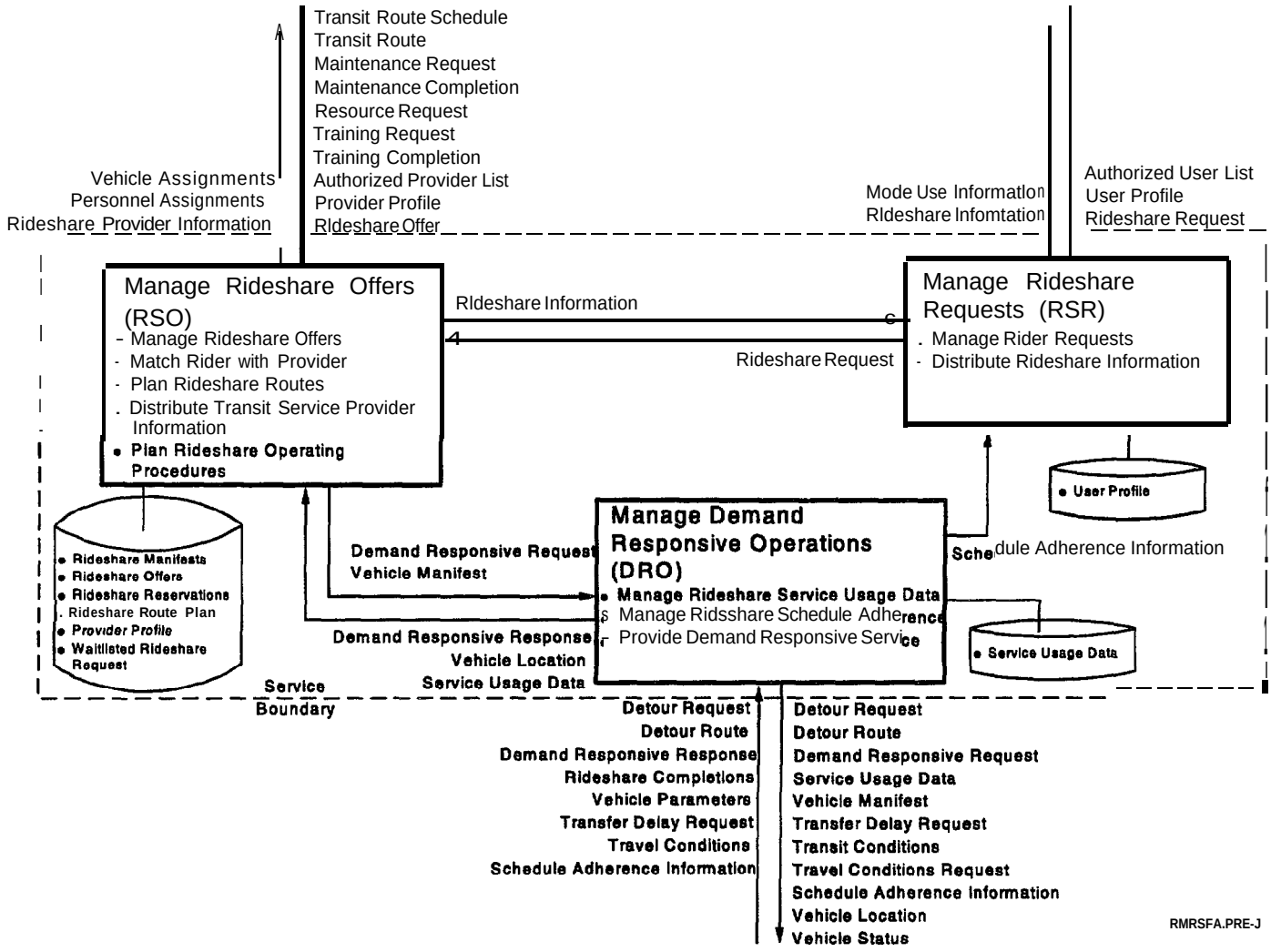

Figure 74. Ride Matching and Reservation - Functional Architecture

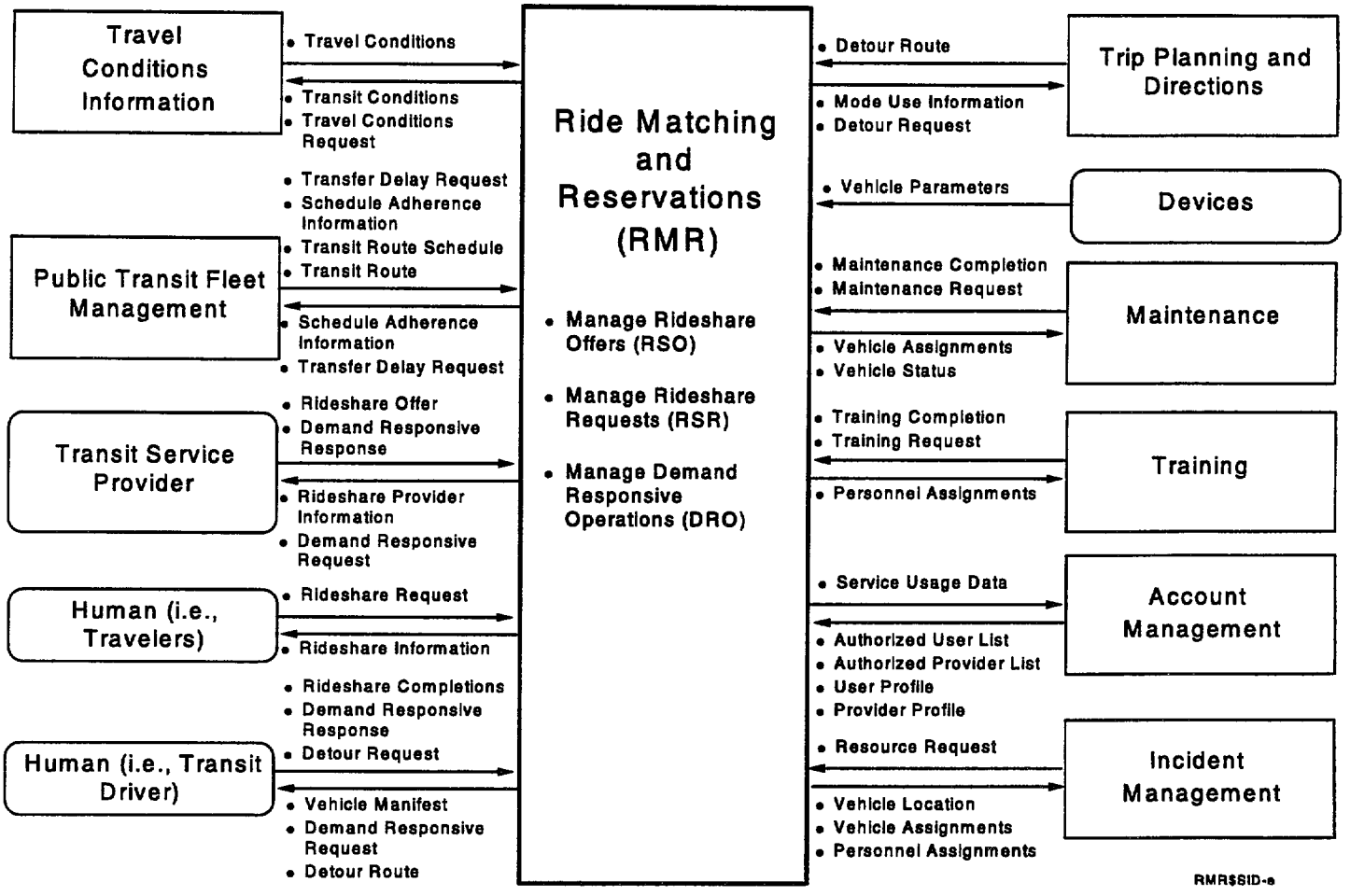

Figure 75. Ride Matching and Reservation - Service Interface Diagram

Ride Matching and Reservations - Manage Rideshare Offers - Inputs

Input Data Name	Definition	Source
Authorized Provider List	consists of a list of authorized rideshare providers.	Account Management (Service)
Demand Resposive Response	provides a response to demand responsive request. This data indicates whether the vehicle driver confirms or denies a real-time demand responsive ride request.	Manage Demand Responsive Operations (Function)
Maintenance Completion	consists of status information pertaining to the maintenance recently performed on the vehicle.	Maintenance (Service)
Maintenance Request	consists of request for preventive or on-demand maintenance on vehicles or equipment based on reported conditions, mileage, or hours of service.	Maintenance (Service)
Provider Profile	consists of information specific to a rideshare provider that uniquely identifies that provider and the services they provide. This data includes vehicle license plate number, vehicle make, vehicle color, driver ID, safety certification linformation	Account Management (Service)
Resource Request	consists of a request to provide personnel, vehicles, and equipment to an incident	Incident Management (Service)
Rideshare Offer	consists of response to rideshare request. Includes trip itinerary, trip origin, destination and frequency, drop-off and pick-up times.	Transit Service Provider (External Interface)
Rideshare Request	(consists of data used to specify a specific trip itinerary, & to reserve or cancel a seat on a vehicle. Includes reservation request, cancellation request, rider ID & constraints, trip origination, destination & frequency, drop-off and pick-up times	Manage Rideshare Requests (Function)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Manage Demand Responsive Operations (Function)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift us at stop.	Manage Demand Responsive Operations (Function)
Training Completion	consists of identification of transit resources that have completed identified training.	Training (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Training (Service)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Public Transit Fleet Management (Service)

Input Data Name	Definition	Source
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Public Transit Fleet Management (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Manage Demand Responsive Operations (Function)

Ride Matching and Reservations - Manage Rideshare Offers - Outputs

Output Data Name	Definition	Destination
Demand Responsive Rquest	is a request to deviate vehicle from previously scheduled route to pick-up an additional passenger.	Manage Demand Responsive Operations (Function)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Incident Management (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Training (Service)
Rideshare Information	consists of identity of the traveler and details of the transit route(s) that fulfill the origin destination requirements (e.g. transit route number, transit stop schedule and cost).	Manage Rideshare Requests (Function)
Rideshare Provider Information	consists of data needed by rideshare transportation providers. This data includes daily trip manifests for each rideshare vehicle, service usage information, etc.	Transit Service Providers (External Interface)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Incident Management (Service)
Vehicle Assignments	consists of assignment of vehicles to facilites, jurisdictions, personnel, incidents, maintenance, training or available.	Maintenance (Service)
Vehicle Manifest	consists of scheduled arrival/departure times, and course of travel for a specified run.	Manage Demand Responsive Operations (Function)

Ride Matching and Reservations - Manage Rideshare Requests - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for the specified service.	Account Management (Service)
Rideshare Information	consists of identity of the traveler and details of the transit route(s) that fulfill the origin destination requirements (e.g. transit route number, transit stop schedule and cost).	Manage Rideshare Offers (Function)
Rideshare Request	consists of data used to specify a specific trip itinerary, & to reserve or cancel a seat on a vehicle. Includes reservation request, cancellation request, rider ID & constraints, trip origination, destination 8 frequency, drop-off and pick-up times	Human (External Interface)
Schedule Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arrival timeand transit stop departure time.	Manage Demand Responsive Operations (Function)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Account Management (Service)

Ride Matching and Reservations - Manage Rideshare Requests - Outputs

Output Data Name	Definition	Destination
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc.) such as rules for use, hours of operation, payment methods, etc.	Trip Planning and Directions (Service)
Rideshare Information	consists of identity of the traveler and details of the transit route(s) that fulfill the origin destination requirements (e.g. transit route number, transit stop schedule and cost).	Humans (External Interface)
Rideshare Request	consists of data used to specify a specific trip itinerary, & to reserve or cancel a seat on a vehicle. Includes reservation request, cancellation request, rider ID & constraints, trip origination, destination &frequency, drop-off and pick-up times	Manage Rideshare Offers (Function)

Ride Matching and Reservations - Manage Demand Responsive Operations - Inputs

Input Data Name	Definition	Source
Demand Responsive Request	is a request to deviate vehicle from previously scheduled route to pick-up an additional passenger.	Manage Rideshare Offers (Function)
Demand Responsive Response	provides a response to demand responsive request. This data indicates whether the vehicle driver confirms or denies a real-time demand responsive ride request.	Human (External Interface)
Demand Responsive Response	provides a response to demand responsive request. This data indicates whether the vehicle driver confirms or denies a real-time demand responsive rider request.	Transit Service Providers (External Interface)
Detour Request	is a request to provide an alternate route between two transit stops.	Human (External Interface)
Detour Route	consists of an alternate route between an origin and destination. Used to route a vehicle around incidents/congestion, or to route a rideshare vehicle to pick up an additional customer.	Trip Planning and Directions (Service)
Rideshare Completions	consists of an indication that a passenger completed a trip.	Human (External Interface)
Schedule Adherence Information	consists of information describing fleet schedule-adherence - indicating route segment running time, transit stop arrival time and transit stop departure time.	Public Transit Fleet Management (Service)
Transfer Delay Request	consists of an inter-agency request to delay departure of a connecting vehicle to assist transfer when the originating vehicle is late.	Public Transit Fleet Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)
Travel Conditions 2	(continued) and weather that is customized to a users specified trip and mode(s).	Travel Conditions Information (Service)
Vehicle Manifest	consists of scheduled arrival/departure times, and course of travel for a specified run.	Manage Rideshare Offers (Function)
Vehicle Parameters	consists of raw (i.e. unsensed) environmental conditions associated with the vehicle (e.g. engine temp, door open/closed, vehicle position, velocity, acceleration, etc.).	Devices (i.e. video, radar, detectors) (External Interface)

Ride Matching and Reservations - Manage Demand Responsive Operations - Outputs

Output Data Name	Definition	Destination
Demand Responsive Request	is a request to deviate vehicle from previously scheduled route to pick-up an additional passenger.	Human (External Interface)
Demand Responsive Request	is a request to deviate vehicle from previously scheduled route to pick-up an additional passenger.	Transit Service Providers (External Interface)
Demand Responsive Response	provides a response to demand responsive request. This data indicates whether the vehicle driver confirms or denies a real-time demand responsive rider request.	Manage Rideshare Offers (Function)
Detour Request	is a request to provide an alternate route between two transit stops.	Trip Planning and Directions (Service)
Detour Route	lconsists of an alternate route between an origin and destination. Used to route a vehicle around incidents/congestion, or to route a rideshare vehicle to pick up an additional customer.	Human (External Interface)
Schedule Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arrival time and transit stop departure time.	Manage Rideshare Requests (Function)
Schedule Adherence Information	consists of information describing fleet schedule adherence - indicating route segment running time, transit stop arrival time and transit stop departure time.	Public Transit Fleet Management (Service)
Service Usage Data -1	consists of data required to generate a users service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Manage Rideshare Offers (Function)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and Idestination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use fat stop.	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Manage Rideshare Offers (Function)
Transfer Delay Request	consists of an inter-agency request to delay departure of a connecting vehicle to assist transfer when the originating vehicle is late.	Public Transit Fleet Management (Service)
Transit Conditions	consists of information about transit vehicle schedule adherence, rideshare data, and transit provider information including but not limited to vehicle ID, [transit stop, estimated vehicle arrival time, estimated vehicle departure time, current schedule.	Travel Conditions Information (Service)

Output Data Name	Definition	Destination
Travel condidtions Request	is a request for travel conditins information. It can-consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Travel conditions Information (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Incident Management (Service)
Vehicle Location	consists of information that indicates the location of each vehicle.	Manage Rideshare Offers (Function)
Vehicle Manifest	consists of scheduled arrival/departure times, and course of travel for a specified run.	Human (External Interface)
Vehicle Status	consists of maintenance conditions associated with the vehicle (including but not limited to fuel levels, brake status, mileage).	Maintenance (Service)

Traffic Control (TC) provides the capabilities to optimize traffic movement on freeways, highways, and arterials throughout jurisdictions and multi-jurisdictional areas. This service provides for coordinated traffic flow via pre-planned traffic control plans. Signal timing and message signing are adaptable based on control plans and real-time traffic conditions feedback.

Figure 76 and Figure 77 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

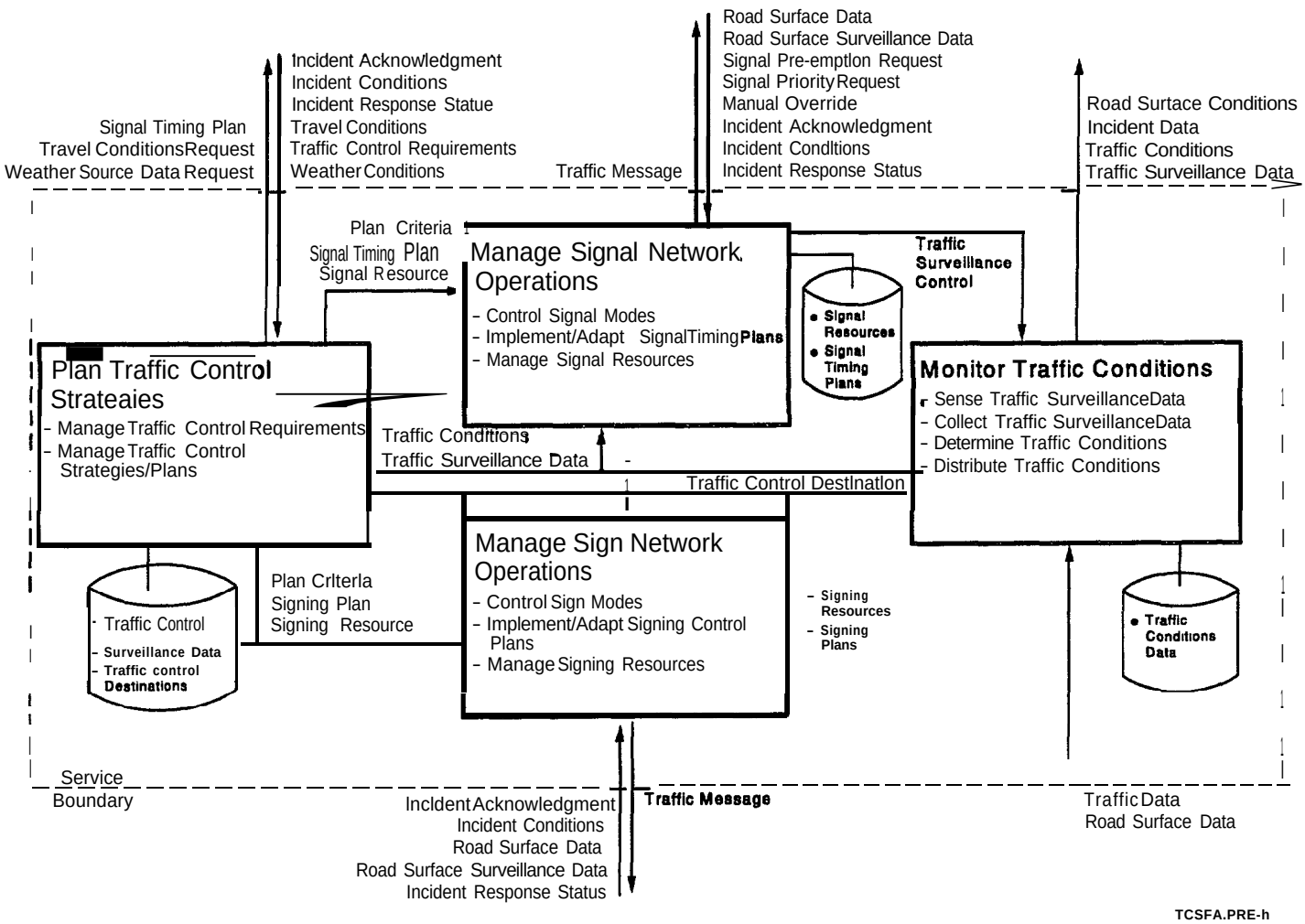

Figure 76. Traffic Control - Functional Architecture

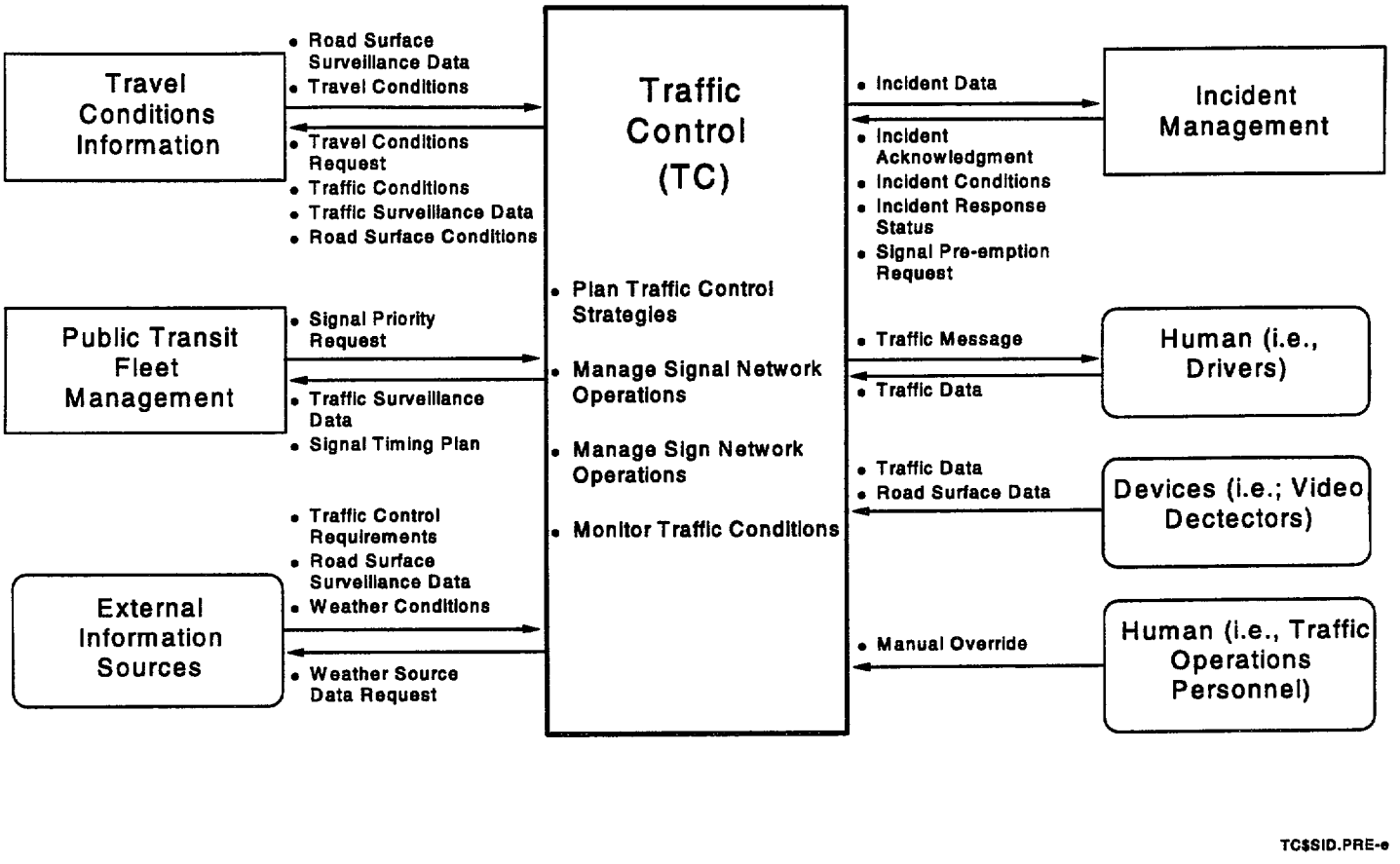

Figure 77. Traffic Control - Service Interface Diagram

Traffic Control - Plan Traffic Control Strategies - Inputs

Input Data Name	Definition	Source
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Incident Management (Service)
Incident Conditions	consists of stored information applicable to en active incident that has impact on current travel conditions	Incident Management (Service)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Incident Management (Service)
Traffic conditions	consists of information about flow of traffic for a predetermined reporting area,	Monitor Traffic Conditions (Function)
Traffic Control Requirements	consists of specific traffic requirements that affect a traffic segment within a particular geographic area. (e.g. quitting time of a large business along a specific roadway.)	External Information Sources (External Interface)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location, (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Monitor Traffic Conditions (Function)
Travel Conditions 1	consists of current/forecast informatidn &out traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Travel Conditions Information (Service)
Weather Conditions	consists of current and/& forecast heather conditions such as rain, snow, fog, sunny, clear.	External Information Sources (External Interface)

Traffic Control - Plan Traffic Control Strategies - Outputs

Output Data Name	Definition	Destination
Plan Criteria	consists of plan conditions under which set of rules, sign and signal plans will operate.	Manage Sign Network Operations (Function)
Plan Criteria	consists of plan conditions under which set of rules, sign and signal plans will operate.	Manage Signal Network Operations (Function)
Signal Resource	consists of the inventory of signal devices that may be used in the creation and implementation of traffic control plans and signal timing plans.	Manage Signal Network Operations (Function)
Signal Timing Plan	consists of the implemented traffic control strategy in the form of a timing algorithm (cycle split, offset, etc)	Manage Signal Network Operations (Function)
Signal Timing Plan	consists of the implemented trafficcontrol strategy in the form of a timing algorithm (cycle split, offset, etc)	Public Transit Fleet Management (Service)
signing Plan	consists of information messages and under what conditions which signs may be used to provide driver notification for unplanned traffic or road conditions.	Manage Sign Network Operations (Function)
Signing Resource	consists of the inventory of sign devices that may be used in thecreation & implementation of traffic control plans 8 signal timing plans.	Manage Sign Network Operations (Function)
Traffic Control Destination	consists of the location requirement of where traffic control data is to be shipped.	Monitor Traffic Conditions (Function)
Travel Conditions Request	is a request for travel conditions information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the users specific needs (e.g.route, mode, jurisdiction)	Travel Conditions-Information (Service)
Weather Source Data Request	is a request for weather data.	External Information Source (External Interface)

Traffic Control - Manage Signal Network Operations - Inputs

Input Data Name	Definition	Source
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data has been received and/or incident resources have been dispatched.	Incident Management (Service)
Incident Conditions	consists of stored information applicable to an active incident that has impact on current travel conditions	Incident Management (Service)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Incident Management (Service)
Manual Override	consists of the system users who have the authority to override the traffic system for maintenance, unplanned traffic timing plans, or incidents.	Human (i.e., Traffic Operations Personnel) (External Interface)
Plan Criteria	consists of plan conditions under which set of rules, sign and signal plans will operate.	Plan Traffic Control Strategies (Function)
Road Surface Data	consists of road surface information that is created for describing the road surace conditions of a pre-determined location. (e.g. condition of the road surface (wet, snow packed, slippery, bumpy, pot holes), road surface temperature, timestamp & location)	Devices (i.e., Video Detectors) (External Interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a predetermined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	External Information Sources (External Interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a pre-determined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	Travel Conditions Information (Service)
Signal Pre - emption Request	is a request from emergency vehicle(s) for immediate pre-emption of intersection traffic signals. An emergency preemption request interrupts traffic signal timing plans to accommodate safe passage of the emergency vehicles.	Incident Management (Service)
Signal Priority Request	is a request to pre-empt intersection traffic signals. This request enables transit vehicles to return to schedule adherence 8 is lower in priority than an emergency vehicle signal preemption request.	Public Transit Fleet Management (Service)
Signal Resource	consists of the inventory of signal devices that may be used in the creation and implementation of traffic control plans and signal timing plans.	Plan Traffic Control Strategies (Function)
Signal Timing Plan	consists of the implemented traffic control strategy in the form of a timing algorithm (cycle split, offset, etc)	Plan Traffic Control Strategies (Function)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Monitor Traffic Conditions (Function)

Input Data Name	Definition	Source
Traffic	consists of procekd and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Monitor Traffic Conditions (Function)

Traffic Control - Manage Signal Network Operations - Outputs

Output Data Name	Definition	Destination
Traffic Message	consists of instructions from traffic signals and signs recommending or directing vehicle drivers to modify their current operating state of the vehicle.	Human (i.e., Driver) (External Interface)
Traffic Surveillance Control	consists of control information for operating traffic signal systems	Monitor Traffic Conditions (Function)

Traffic Control - Manage Sign Network Operations - Inputs

Input Data Name	Definition	Source
Incident Acknowledgment	consists of notification to the reporting source of the incident that incident data Incident has been received and/or incident resources have been dispatched.	Incident Management (Service)
Incident Conditions	Consists of stored information applicable to an active incident that has impact on current travel conditions	Incident Management (Service)
Incident Response Status	consists of ETAS of responding resources, current step of response procedure, and estimated time that the incident is cleared	Incident Management (Service)
Plan Criteria	consists of plan conditions under which set of rules, sign and signal plans will operate.	Plan Traffic Control Strategies (Function)
RoadSurface Data	consists of road surface information that is created for describing the road surface conditions of a predetermined location. (e.g. condition of the road surface (wet, snow packed,slippery,bumpy,pot hole, road surface temperature, timestamp & location)	Devices(video, radar, detectors, etc.) (External Interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a predetermined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	External information Sources (External Interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for idescribing the road surface conditions of a predetermined location. (e.g. consdition of road surface, road surface temperature, timestamp, & location)	Travel Conditions Information (Service)
Signing Plan	consists of information messages and under what conditions which signs may be used to provide driver notification for unplanned traffic or road conditions.	Plan Traffic Control Strategies (Function)
Signing Resource	consists of the inventory of sign devices that may be used in the creation & implementation of traffic control plans 8 signal timing plans.	Plan Traffic Control Strategies (Function)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Monitor Traffic Conditions (Function)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Monitor Traffic Conditions (Function)

Traffic Control - Manage Sign Network Operations - Outputs

Output Data Name	Definition	Destination
Traffic Message	consists of instructions from traffic signals and signs recommending or dircting vehicle drivers to modify their current operating state of the vehicle.	Human (i.e., Driver) (External Interface)

Traffic Control - Monitor Traffic Conditions - Inputs

Input Data Name	Definition	Source
Road Surface Data	consists of road surface information that is-created for describing the road surface conditions of a predetermined location. (e.g. condition of the road surface (wet, snow packed,slippery,bumpy,pot holes), road surface temperature, timestamp & location)	Devices(Video, Detectors) (External Interface)
Traffic Control Destination	consists of the location requirement of where traffic control data is to be shipped	Plan Traffic Control Strategies (Function)
Traffic Data	consists of traffic related information that is created for describing the traffic conditions of a predetermined location. (e.g. speed, vehicle quantity,density,time stamp, & location of where the data is generated).	Devices(Video, Detectors) (External Interface)
Traffic Data	consists of traffic related information that is created for describing the traffic conditions of a pre-determined location. (e.g. speed, vehicle quantity,density, time stamp, & location of where the data is generated).	Human (i.e., Drivers) (External Interface)
Traffic Surveillance Control	consists of control information for operating traffic signal systems	Manage Signal Network Operations (Function)

Traffic Control - Monitor Traffic Conditions - Outputs

Output Data Name	Definition	Destination
Incident Data	consists of information that is collected about an incident but may not be organized or stored in a repository. (e.g. incident location, type of incident and timestamp)	Incident Management (Service)
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface lsurveillance data and weather forecasts).	Travel Conditions Information (Service)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Manage Sign Network Operations (Function)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Manage Signal Network Operations (Function)
Traffic Conditions	consists of information about flow of traffic for a Pre-determined reporting area.	Plan Traffic Control Strategies (Function)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Travel Conditions Information (Service)
Traffic Sruveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Plan Traffic Control Strategies (Function)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or iincidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Manage Signal Network Operations (Function)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or Incidents that may effect the travel of drivers within a pm-defined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Public Transit Fleet Management (Service)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density time stamp, and location of where data is generated.	Manage Sign Network Operations (Function)
Traffic Surveillance Data	consists of processed and summarized information-about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Travel Conditions Information (Service)

Training (TNG) provides a capability to educate both transportation service provider personnel and public users of transportation services. For transportation service provider personnel, Training compares personnel training records with periodic training and certification requirements to develop a prioritized list of training tasks. Personnel availability is then compared to the prioritized list of training tasks and course availability information to assign personnel to courses. Personnel training and certification history information is maintained to plan future training activity, and to assist various regulatory agencies by providing easy access to credential information.

Figure 78 and Figure 79 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

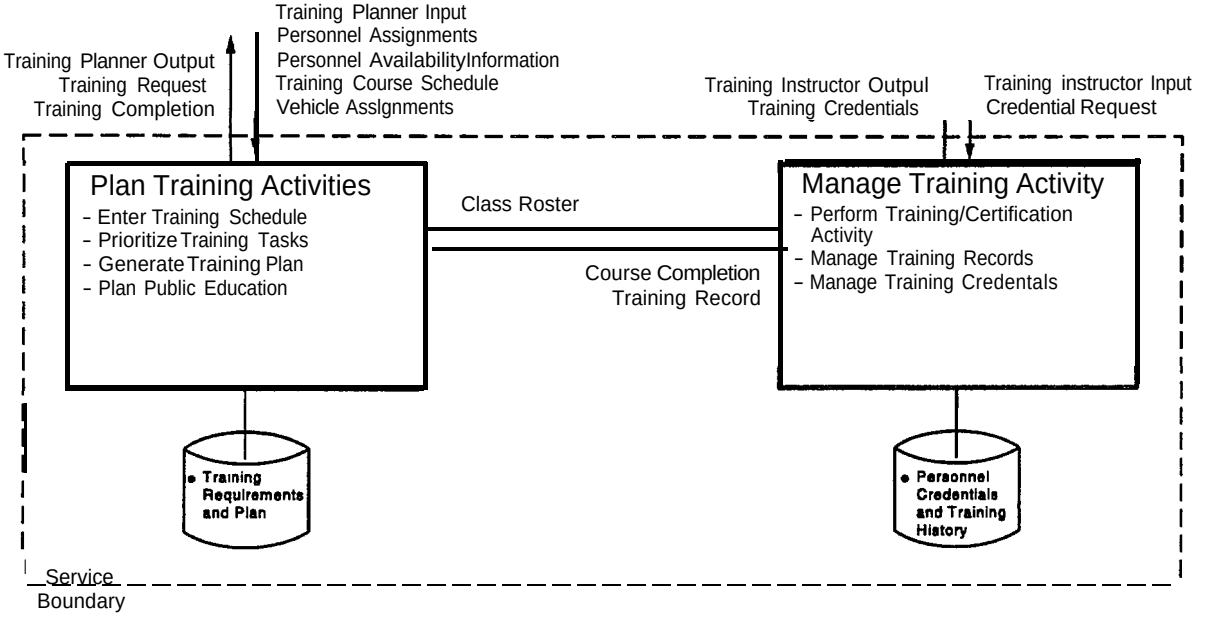

Figure 78. Training - Functional Architecture

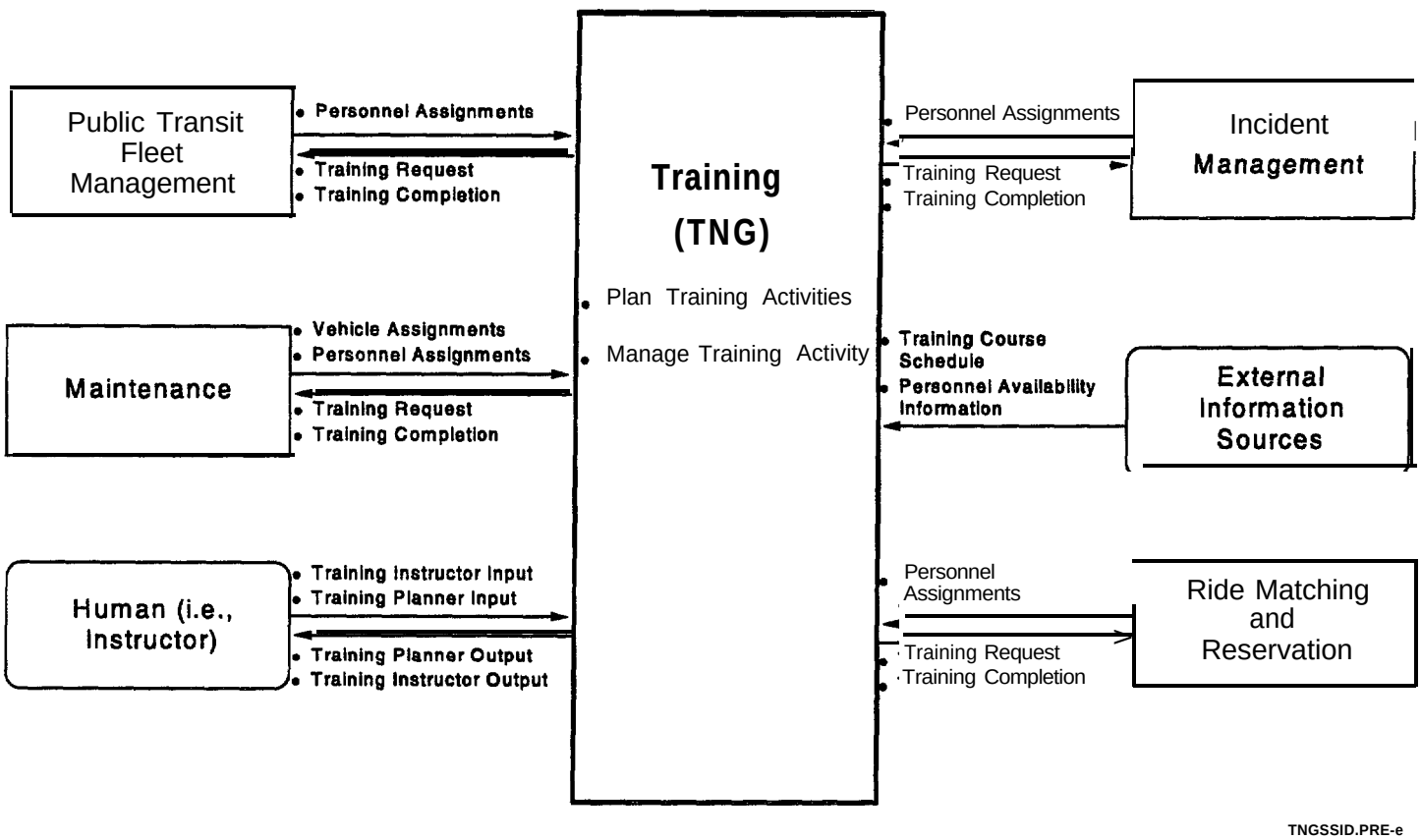

Figure 79. Training - Service Interface Diagram

Training - Plan Training Activities - Inputs

Input Data Name	Definition	Source
Course Completion		Manage Training Activities (Function)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Incident Management (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Maintenance (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Public Transit Fleet Management (Service)
Personnel Assignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Public Travel Security/Enforcement (Service)
personnel ssignments	consists of driver-to-run, driver-to-incident, supervisor-to-incident, maintenance personnel-to-incident, driver-to-training, and supervisor-to-training assignments.	Ride Matching and Reservations (Service)
Personnel Availability Information	consists of transit personnel available for assignments	personnel Management Systems (External Interface)
Training Course Schedule		External Information Sources (External Interface)
Training Planner Input		Human (External Interface)
Training Record		Manage Training Activities (Function)
Vehicle Assignments	consists of assignment of vehicles to facilities jurisdiction& personnel, incidents, maintenance, training or available.	Maintenance (Service)

Training - Plan Training Activities - Outputs

Output Data Name	Definition	Destination
Class Roster		Manage Training Activities (Function)
Training Completion	consists of identification of transit resources that have completed identified training.	Incident Management (Service)
Training Completion	consists of identification of transit resources that have completed identified training.	Maintenance (Service)
Training Completion	consists of identification of transit resources that have completed identified training.	Public Transit Fleet Management (Service)
Training Planner Output		Human (External Interface)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Incident Management (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Maintenance (Service)
Training Request	consists of a notice that particular resources are scheduled to attend a particular training activity.	Public Transit Fleet Management (Service)

Training - Manage Training Activities - Inputs

Input Data Name	Definition	Source
Class Roster		Plan Training Activities (Function)
Credential Request		Public Travel Security/Enforcement (Service)
Training Instructor Input		Human (External Interface)

Training - Manage Training Activities - Outputs

Output Data Name	Definition	Destination
Course Completion		Plan Training Activities (Function)
Training Credentials		Public Travel Security/Enforcement (Service)
Training Instructor Output		Human-(External Interface)
Training Record		Plan Training Activities (Function)

Travel Conditions Information (TCI) provides current and/or forecast (future) travel conditions for a specific area or along a specific single mode or multi-modal route. Travel conditions information includes traffic speeds and congestion levels, weather, road surface conditions, accidents, construction, planned events, transit conditions, and parking lot status. The effects these conditions have on travel are also reported, including delay times, reduced speeds, dangers/hazards, road/ramp closures, detours, parking availability, and expected duration of the conditions (start time and end time). Travel conditions information can be tailored to a user's needs through use of a profile. Travel conditions information is provided to travelers prior to their trip, or en route, through a variety of devices.

Figure 80 and Figure 81 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

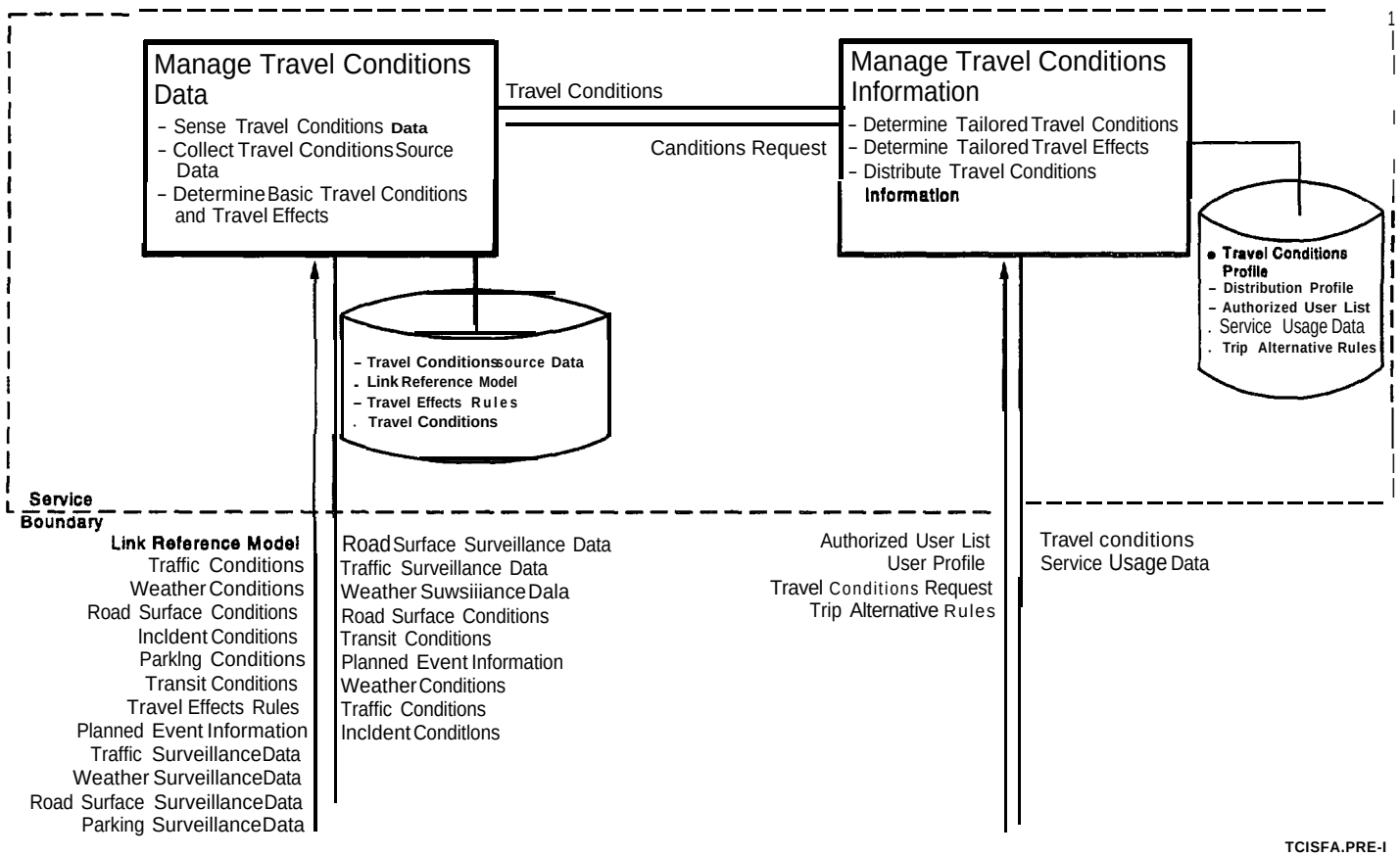

Figure 80. Travel Conditions Information - Functional Architecture

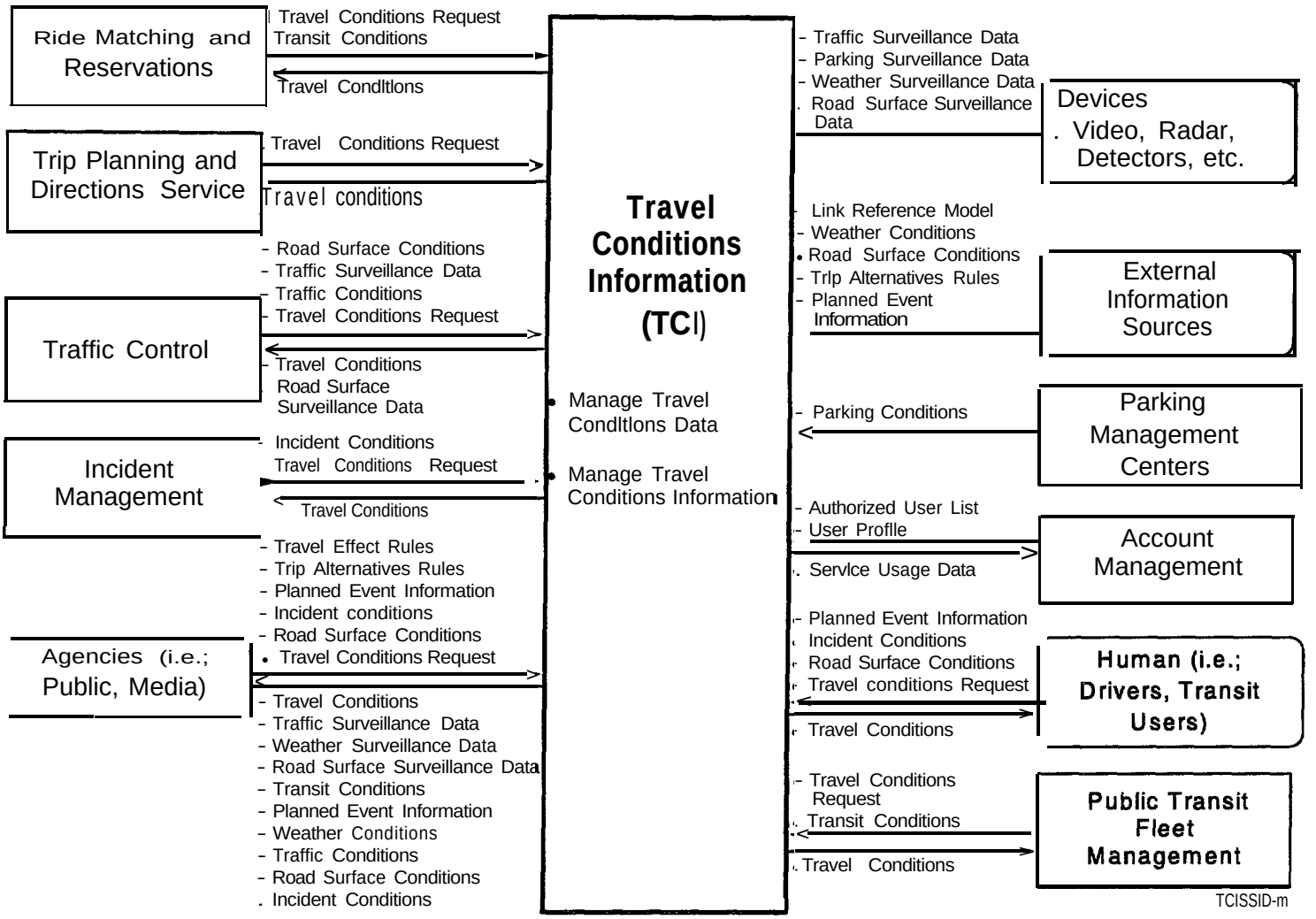

Figure 8 1. Travel Conditions information - Service Interface Diagram

Travel Conditions Information - Manage Travel Conditions Data - Inputs

Input Data Name	Definition	Source
Conditions Request	consists of a request for travel conditions information that has been geographically referenced.	Manage Travel Conditions Information (Function)
Incident conditions	consists of stored information applicable to an active incident that has impact on current travel conditions	Agencies (External Interface)
Incident Conditions	consists of stored information applicable to an active incident that has impact on current travel conditions	Humans (External Interface)
Incident Conditions	consists of stored information applicable to an active incident that has impact on current travel conditions	Incident Management (Service)
Link Reference Model	link map containing all the fundamental geographicfeatures and location reference information required for, and from which, other maps showing specialized information can be prepared.	External Information Sources (External Interface)
Parking Conditions	consists of information about parking availability and parking lot status (e.g open, closed)	Parking Management Centers (External Interface)
Parking Surveillance Data	consists of current counts on number of vehicles entering and exiting a parking lot as received from devices (e.g. parking lot gate)	Devices(video, radar, detectors, etc.) (External Interface)
Planned Event Information	consists of information about construction and/or special events (e.g. sporting events parades)	Agencies (External Interface)
Planned Event Information	consists of information about construction and/or special events (e.g. sporting events, parades)	External Information Sources (External Interface)
Planned Event Information	consists of information about construction and/or special events (e.g. sporting events, parades)	Humans (External Interface)
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface surveillance data and weather forecasts).	Agencies (External Interface)
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface surveillance data and weather forecasts).	Extenal Information Sources (External Interface)
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface surveillance data and weather forecasts).	Humans (External Interface

Input Data Name	Definition	Source
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface surveillance data and weather forecasts).	Traffic Control (Service)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a predetermined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	Devices (video, radar, detectors, etc.) (External Interface)
Traffic Conditions	consists of information about flow of traffic for a pre-determined reporting area.	Traffic Control (Service)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Devices(video, radar, detectors, etc.) (External Interface)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a predefined geographic location. (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Traffic Control (Service)
Transit Conditions	consists of information about transit vehicle schedule adherence, rideshare data and transit provider information including but not limited to vehicle ID, transit stop, estimated vehicle arrival time, estimated vehicle departure time, current schedule.	Ride Matching and Reservations (Service)
Transit Conditions	consists of information about transit vehicleschedule adherence, rideshare data and transit provider information including but not limited to vehicle ID, transit stop, estimated vehicle arrival time, estimated vehicle departure time, current schedule.	Public Transit Fleet Management (Service)
Travel Effects Rules	consists of rules to help determine the effects of travel conditions along a mode segment.	Public Agencies (External Interface)
Weather Conditions	consists of current and/or forecast weather conditions such as rain, snow, fog, sunny, clear.	External Information Sources (External Interface)
Weather Surveillance Data	consists of current weather data as received from devices (e.g. radar, video).	Devices (video, radar, detectors, etc.) (External Interface)

Travel Conditions Information - Manage Travel Conditions Data - Outputs

Output Data Name	Definition	Destination
Incident Conditions	consists of stored information aplicable to an active incident that has impact on current travel conditions	Agencies (i.e.. public, media) (External Interface)
Planned Event Information	consists of information about construction and/or special events (e.g. sporting events, parades)	Agencies (i.e., public, media) (External Interface)
Road Surface Conditions	consists of current and/or forecast road conditions such as dry, wet, flooded, snow covered, slippery, plowed, salted, sanded (based on road surface (surveillance data and weather forecasts).	Agencies (i.e.: public, media) (External Interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a pre-determined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	Agencies (i.e., public, media) (External interface)
Road Surface Surveillance Data	consists of processed and summarized information that is created for describing the road surface conditions of a predetermined location. (e.g. condition of road surface, road surface temperature, timestamp, & location)	Traffic Control (Service)
Traffic Conditions	consists of information about flow of traffic for a predetermined reporting area.	Agencies (i.e., public, media) (External Interface)
Traffic Surveillance Data	consists of processed and summarized information about vehicles or incidents that may effect the travel of drivers within a pm-defined geographic location (e.g. speed, vehicle quantity, road density, time stamp, and location of where data is generated.	Agencies (i.e., public, media) (External Interface)
Transit Conditions	consists of information about transit vehicle schedule adherence, rideshare data, and transit provider information including but not limited to vehicle ID, transit stop, estimated vehicle arrival time, estimated vehicle departure time, current schedule.	Agencies (i.e., public, media) (External Interface)
Travel Conditions	consists of current/forecast infonationabout traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Manage-Travel Conditions Information (Function)
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s)	Manage Travel Conditions Information (Function)
Weather Conditions	consists of current and/or forecast weather conditions such as rain, snow, fog sunny, clear.	Agencies (i.e., public, media) (External Interface)
Weather Surveillance Data	consists of current weather data as received from devices (e.g. radar, video)	Agencies (i.e., public, media) (External Interface)

Travel Conditions Information - Manage Travel Conditions Information - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for-the specified service.	Account Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Manage Travel Conditions Data (Function)
Travel Conditions 2	(continued) and weather that iscustomized to a user' s specified trip and mode(s)	Manage Travel Conditions Data (Function)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the users specific needs (e.g.route, mode, jurisdiction)	Agencies (i.e., Public, Media) (External Interface)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Human (Drivers, Transit User) (External Interface)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the users specific needs (e.g.route, mode, jurisdiction)	Incident Management (Service)
Travel Conditions Request	is a request for travel conditons information: It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the users specific needs (e.g.route, mode, jurisdiction)	Public Transit Fleet Management (Service)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Ride Matching and Reservations (Service)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for air basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Traffic Control (Service)
Travel Conditions Request	is a request for travel conditons information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Trip Planning and Directions (Service)
Trip Alternative Rules	consists of rules to assist in determining the traveler's alternatives.	External Information Sources (External Interface)
Trip Alternative Rules	consists of rules to assist in determining the traveler's alternatives.	Public Agencies (External Interface)
User Profile	consistsof information specific to a user that uniquely identifies that user and their travel information preferences.	Account Management (Service)

Travel Conditions Information - Manage Travel Conditions Information - Outputs

Output Data Name	Definition	Destination
Conditions Request	consists of a request for travel conditions information that has been geographically referenced.	Manage Travel Conditions Data (Function)
Service Usage Data -1	consists of data required to generate a users service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Account Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Agencies (Public, Media) (External Interface)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned levent information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Humans (i.e., Drivers, Transit Users) (External Interface)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Incident Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Public Transit Fleet Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Ride Matching and Reservations (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Traffic Control (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Trip Planning and Directions (Service)
Travel Conditions 2	(continued) and weather that is customized to a user' s specified trip and mode(s).	Agencies (Public, Media) (External Interface)
Travel Conditions 2	(continued) and weather that is customized to a users specified trip and mode(s).	Humans (i.e., Drivers, Transit Users) (External Interface)
Travel Conditions 2	(continued) and- weather that is customized to a user's specifiedtrip and	Incident Management (Service)

Output Data Name	Definition	Destination
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Public Transit Fleet Management (Service)
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Ride Matching and Reservations (Service)
Travel Conditions 2	(Continued) and weather that is customized to a user's specified trip and mode(s).	Traffic Control (Service)
Travel Conditions 2	(continued) and weather that is customized to a user's specified trip and mode(s).	Trip Planning and Directions (Service)

Traveler Services Information (TSI) provides travelers with access to "yellow pages" information such as restaurants, lodging, vehicle services, tourist sights, shopping and special events. Users can request and receive traveler services information that is tailored to their specific request, their preferences (such as price, provider, cuisine, etc.) and/or a location perspective (such as nearest to my current location, at this exit, along my route, at my destination, etc.). This service also provides the traveler with the capability to make reservations or purchase tickets. The Traveler Services Information service can interact with the Trip Planning and Directions service to provide users with routes, directions and/or a trip itinerary that is based on the traveler services that were requested.

Figure 82 and Figure 83 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

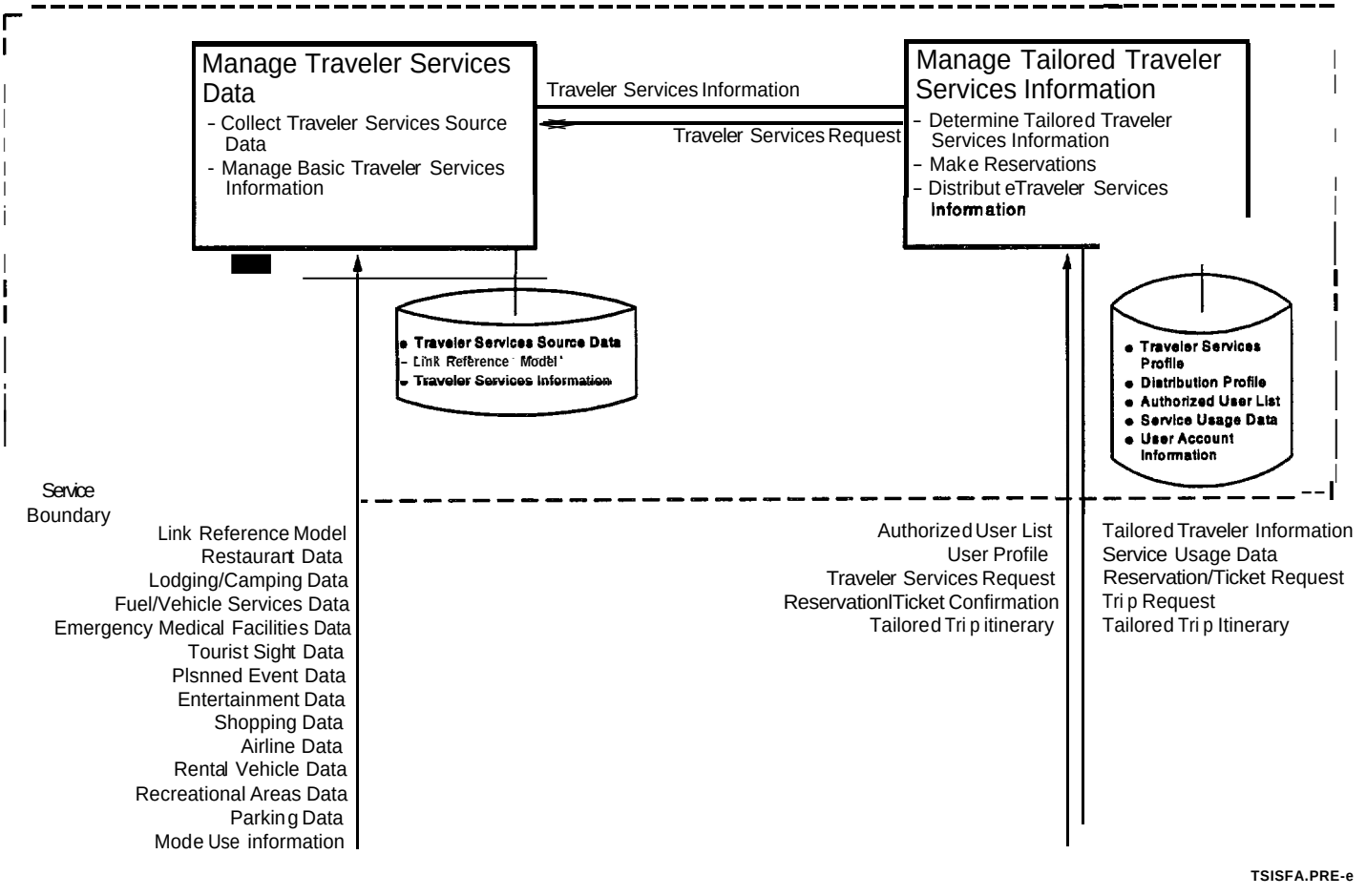

Figure 82. Traveler Services Information - Functional Architecture

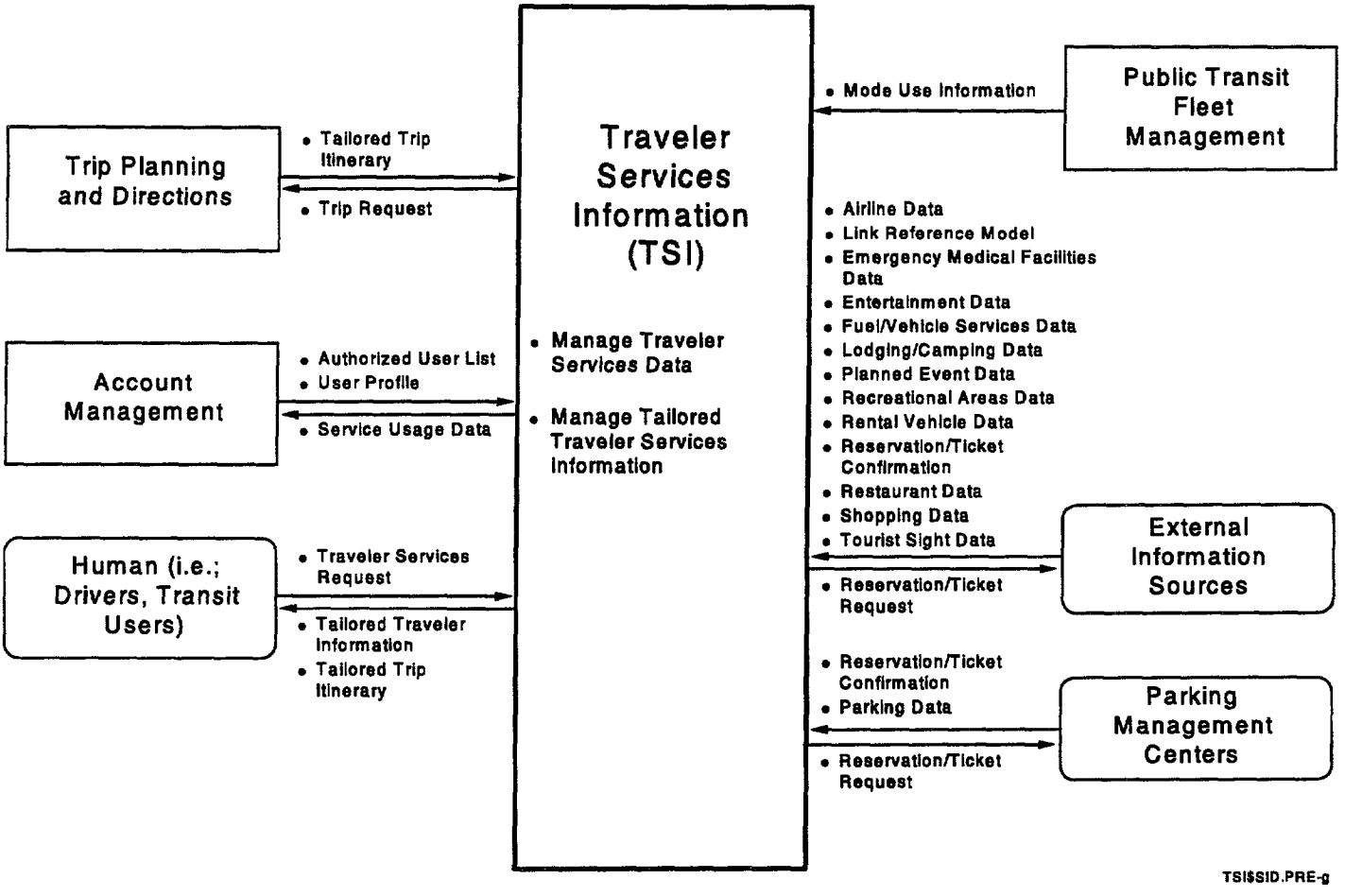

Figure 83. Traveler Services Information - Service Interface Diagram

Traveler Services Information - Manage Traveler Services Data - Inputs

Input Data Name	Definition	Source
Airline Data	consists of contact information for an airline as well as information about flight Schedules arrival, departure times, and ticket prices.	External Information Sources (External Interface)
Emergency Medical Facilities Data	consists of information about facilities that provide emergency medical treatment	External Information Sources (External Interface)
Entertainment Data	consists of information about facilities that provide entertainment services (e.g. type of entertainment, location of facility, phone number, etc).	External Information Sources (External Interface)
Fuel / Vehicle Services Data	consists of information about facilities for fuel and vehicle repair services.	External Information Sources (External Interface)
Link Reference Model	a map containing all the fundamental geographic features and location reference information required for, and from which, other maps showing specialized information can be prepared.	External Information Sources (External Interface)
Lodging / Camping Data	consists of information about lodging and camping facilities.	External Information Sources (External Interface)
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc.) such as rules for use, hours of operation, payment methods, etc.	Public Transit Fleet Management (Service)
Parking Data	consists of information about parking lot location, parking rates, hours of operation and any special services that may be offered.	Parking Management Centers (External Interface)
Planned Event Data	consists of information about special events(e.g. sporting events,parades).	External Information Sources (External Interface)
Recreational Areas Data	consists of information about recreation facilities such as parks, trails, etc.	External Information Sources (External Interface)
Rental Vehicle Data	consists of contact information for rental vehicle companies as well as information on rates and availability of vehicles.	External Information Sources (External Interface)
Restaurant Data	consists of information about restaurant facilities.	External Information Sources (External Interface)
Shopping Data	consists of information about shopping facilities such as mails, outlets, etc.	External Information Sources (External Interface)

Input Data Name	Definition	Source
Tourist Sight Data	consists of information about tourist sights such as museums, monuments, historical sights, etc.	External Information Sources (External Interface)
Traveler Services Request	consists of a request for any yellow pages or other traveler information (i.e. medical facilities, airline, rental car, etc.)	Manage Tailored Traveler Services Information (Function)

Traveler Services Information - Manage Traveler Services Data - Outputs

Output Data Name	Definition	Destination
Traveler Services Information	consists of yellow pages (food, lodging, fuel, tourist sight) and other traveler information (medical facilities, airline, rental vehicles) that has been referenced to a geographic location on a map.	Manage Tailored Traveler Services Information (Function)

Traveler Services Information - Manage Tailored Traveler Services Information - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for the specified service. -	Account Management (Service)
Reservation/Ticket Confirmation	consists of an acknowledgement that a reservation has been made or a ticket has been purchased.	External Information Sources (External Interface)
Reservation/Ticket Confirmation	consists of an acknowledgement that a reservation has been made or a ticket has been purchased.	Parking Management Centers (External Interface)
Tailored Trip Itinerary	consists of all information about a user's specific trip and mode(s) including route (w/map), directions, schedule (and date) information, information about destination point(s) and points of interest, etc.	Trip Planning and Directions (Service)
Traveler Services Information	consists of yellow pages (food, lodging, fuel, tourist sight) and other traveler information (medical facilities, airline, rental vehicles) that has been (referenced to a geographic location on a map.	Manage Traveler Services Data (Function)
Traveler Services Request	consists of a request for any yellow pages or other traveler information (i.e. medical facilities, airline, rental car, etc.)	Human (i.e., Drivers, Transit Users) (External Interface)
User Profile	consists of information specific to a user that uniquely identifies that user and their travel information preferences.	Account Management (Service)

Traveler Services Information - Manage Tailored Traveler Services Information - Outputs

Output Data Name	Definition	Destination
Reservation/Ticket Request	consists of a request to a provider for a ticket or a reservation:-	External Information Sources (External Interface)
Reservation/Ticket Request	consists of a request to a provider for a ticket or a reservation.	Parking Management Centers (External Interface)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trip origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payement method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Account Management (Service)
Tailord Traveler Information	consists of yellow pages (food,lodging,fuel,tourist sight) and other traveler info (medical facilities, airline, rental vehicle) that is customized to a user's specified trip and mode(s).	Human (Drivers, Transit Users) (External Interface)
Tailored Trip Itinerary	consists of all infonation about a user's specific trip and mode(s) including lroute (w/map), directions, schedule (and date) information, information about destination point(s) and points of interest, etc.	Human (Drivers, Transit users. (External Interface)
Traveler Services Request	consists of a request for any yellow pages or other traveler information (i.e. medical facilities, airline, rental car, etc.)	Manage Traveler Services Data (Function)
Trip Request	consists of a request for a tailored route, directions, and/or itinerary	Trip Planning and Directions (Service)

Trip Planning and Directions (TPD) provides the ability to build the optimum single or multi modal route, directions or trip itinerary based on a mix of user-specified criteria such as origin/destination, travel mode(s), departure time, arrival time, trip duration, preferred route type, cost, etc. Trip Planning and Directions supports "what if' route planning based on different criteria combinations. This service recommends alternate routes/route segments based on user criteria or travel conditions changes. Detour routes are determined for public transit agencies by this service in order to keep transit vehicles on schedule.

The Trip Planning and Directions Service also provides the ability to get step-by-step directions, in text and/or map form, for any route or user-specified destination. Optionally, this service provides automated location, and guidance through a set of directions. This service can assemble tailored trip itineraries which include a route highlighted on a map, directions, schedule and date information (if required), information about destination point(s) and information about points of interest along a route.

Figure 84 and Figure 85 show the functional architecture and interfaces associated with this service, and are repeated from the main body of the system specification for the convenience of the reader. Following the figures is a set of tables that define the input and output data flows for each function that appears in the figure.

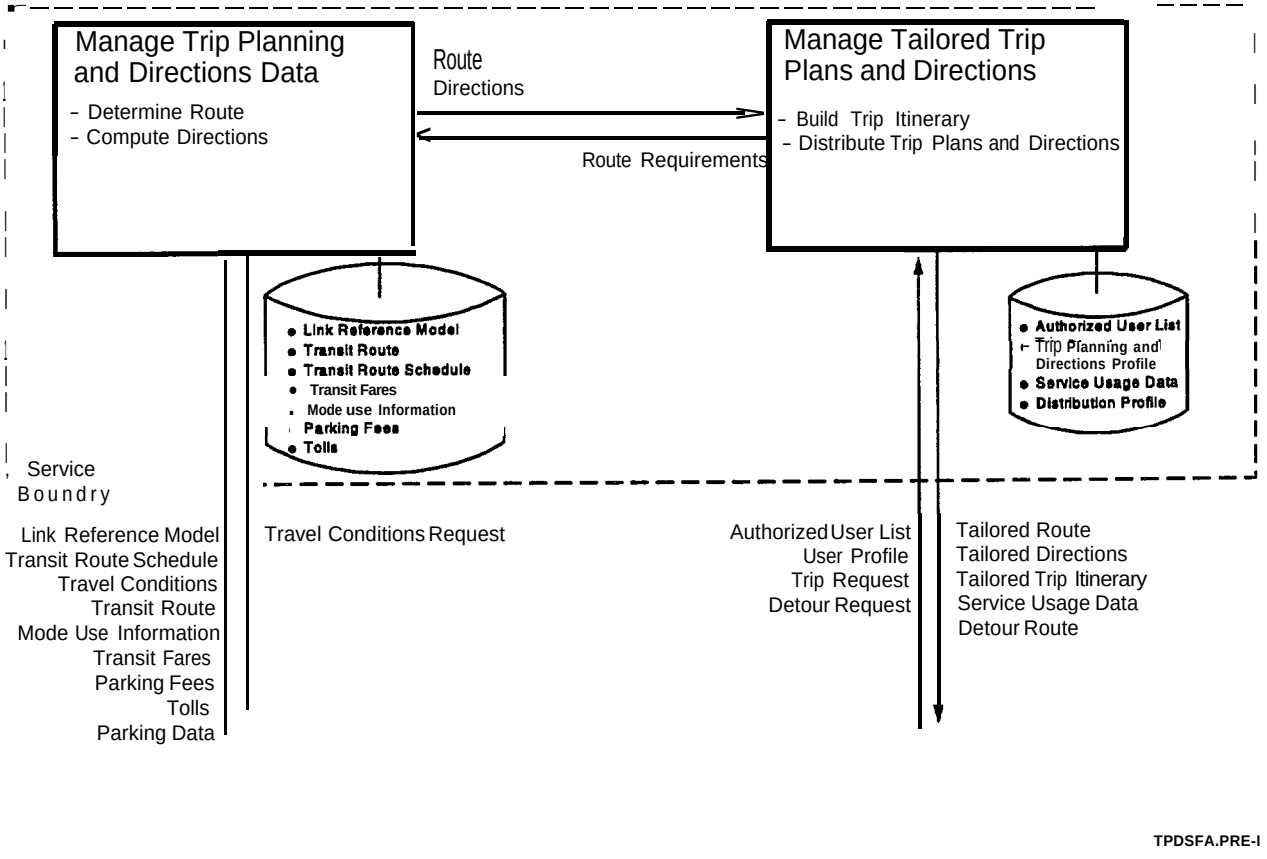

Figure 84. Trip Planning and Directions - Functional Architecture

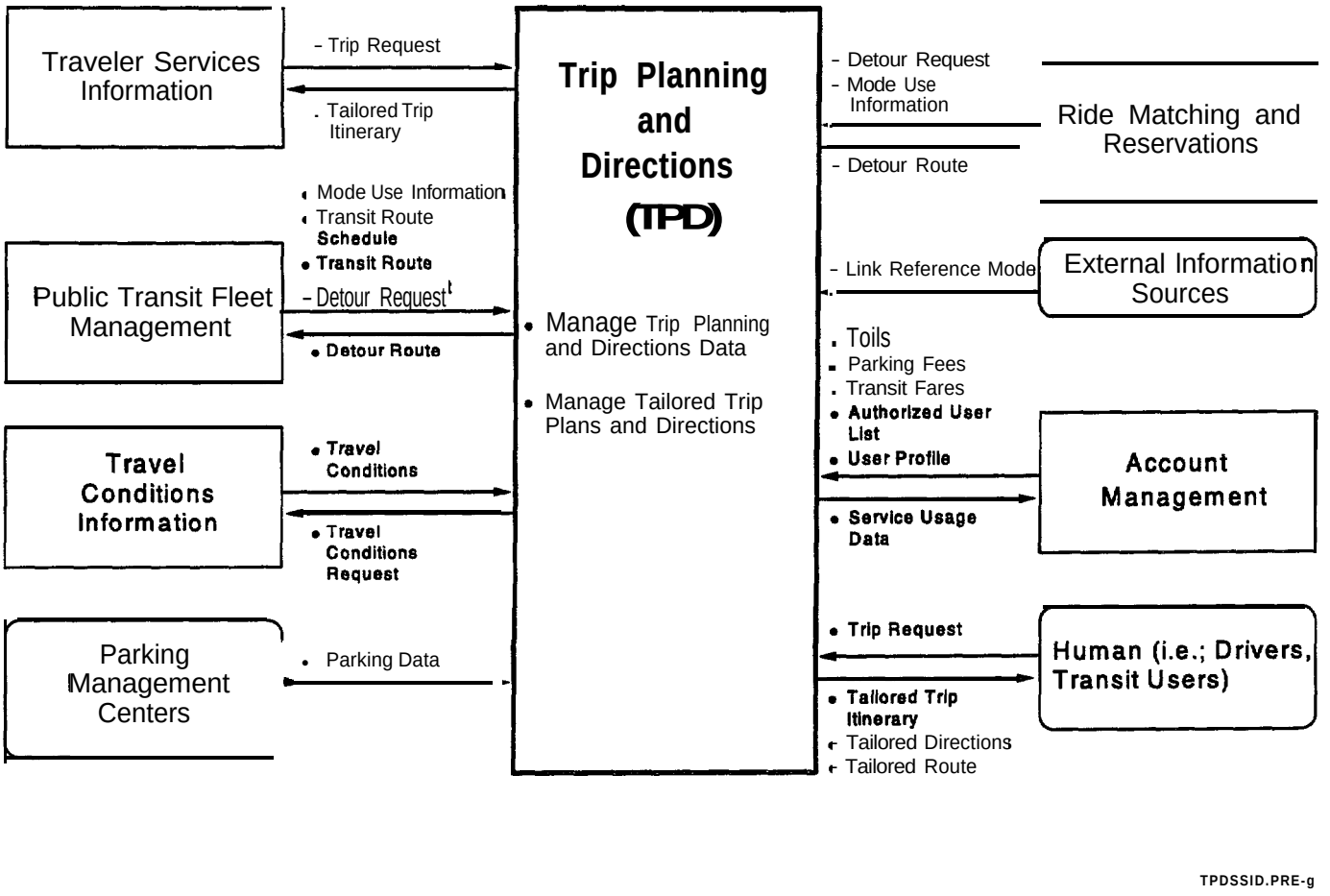

Figure 85. Trip Planning and Directions - Service Interface Diagram

Trip Planning and Directions- Manage Trip Planning and Directions Data - Inputs

Input Data Name	Definition	Source
Link Reference Model	consists of a commonly defined set of point, linear, and area geographical locations, such as roadway links, which ITS systems use to share geographical information between themselves.	External Information Sources (External Interface)
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc.) such as rules for use, hours of operation, payment methods, etc.	Public Transit Fleet Management (Service)
Mode Use Information	consists of information on how to use a specific transit mode (e.g. bus, train, etc,) such as rules for use, hours of operation, payment methods, etc.	Ride Matching and Reservations (Service)
Parking Data	consists of information about parking lot location, parking rates, hours of operation and any special services that may be offered.	Parking Management Centers (External Interface)
Parking Fees	consissts of the specific prices charged for parking services.	Account Management (Service)
Route Requirements	consists of the parameters needed to determine a course of travel from the user's specified origin to their specified destination	Manage Tailored Trip Plans and Directions (Function)
Tolls	consist of the specific prices charged for use of a roadway	AccountManagement (Service)
Transit Fares	consists of the specific prices charged for transit services	Account Management (Service)
Transit Route	consists of Fixed Routes and Flexible Routes information.	Public Transit Fleet Management (Service)
Transit Route Schedule	consists of arrival/departure times for each transit stop location along each transit route as well as transfer information.	Public Transit Fleet Management (Service)
Travel Conditions 1	consists of current/forecast information about traffic conditions, planned event information, incident conditions (e.g., accidents), transit conditions, road surface conditions, parking conditions (continued)	Travel Conditions Information (Service)
Travel Conditions 2	(continued) and weather that is customized to a users specified trip and mode(s)	Travel Conditions Information (Service)

Trip Planning and Directions - Manage Trip Planning and Directions Data- Outputs

Output Data Name	Definition	Destination
Directions	consists of step by step instructions that guide a user form their specified origin to their specified destination	Manage Tailored Trip Plans and Directions (Function)
Route	consists of a course of travel from a user's specified point of origin to their specified destination.	Manage Tailored Trip Plans and Directions (Function)
Travel Conditions Request	is a request for travel conditions information. It can consist of a request for all basic travel conditions info or for travel conditions info. tailored to the user's specific needs (e.g.route, mode, jurisdiction)	Travel Conditions Information (Service)

Trip Planning and Directions- Manage Tailored Trip Plans and Directions - Inputs

Input Data Name	Definition	Source
Authorized User List	consists of a list of authorized users for the specified service.	Account Management (Service)
Detour Request	is a request to provide an alternate route between two transit stops.	Public Transit Fleet Management (Service)
Detour Request	is a request to provide an alternate route between two-transit stops.	Ride Matching and Reservations (Service)
Directions	consists of step by step instructions that guide a user form their specified origin to their specified destination	Manage Trip Planning and Directions Data (Function)
Route	consists of a course of travel from a users specified point of origin to their specified destination.	Manage Trip Planning and Directions Data (Function)
Trip Request	consists of a request for a tailored route, directions, and/or intinerary.	Human (Drivers, Transit Users) (External Interface)
Trip Request	consists of a request for a tailored route, directions, and/or itinerary.	Traveler- Services Information (Service)
User Profile	consists of information specific to a user that uniquely identifies that user and theri travel information preferences.	Account Management (Service)

Trip Planning and Directions - Manage Tailored Trip Plans and Directions - Outputs

Output Data Name	Definition	Destination
Detour Route	consists of an alternate route between an origin and destination. Used to route a vehicle around incidents/congestion, or to route a rideshare vehicle to pick up an additional customer.	Public Transit Fleet Management (Service)
Detour Route	consists of an alternate route between an origin and destination. Used to route a vehicle around incidents/congestion, or to route a rideshare vehicle to pick up an additional customer.	Ride Matching and Reservations (Service)
Route Requirements	consists of the parameters needed to determine a course of travel from the user's specified origin to their specified destination	Manage Trip Planning and Directions Data (Function)
Service Usage Data -1	consists of data required to generate a user's service invoice for services rendered as well as overall transit resource statistics, including trio origin and destination, departure and arrival time, vehicle % full at stop, (continued)	Account Management (Service)
Service Usage Data -2	(continued) number of passengers entering and exiting vehicle at stop, payment method, fare type, vehicle dwell time at stop, and wheel chair lift use at stop.	Account Management (Service)
Tailored Directions	consists of step-by-step instructions that guide a user from their specified origin to their specified destination, using multiple transportation modes (if necessary).	Human (Drivers, Transit Users) (External Interface)
Tailored Route	(consists of a course of travel from the users specified point of origin to their specified destination using multiple transportation modes (if desired).	Human (Drivers, Transit Users) (External Interface)
Tailored Trip Itinerary	consists of all information about a user's specific trip and mode(s) including route (w/map), directions, schedule (and date) information, information about destination point(s) and points of interest, etc.	Human (Drivers, Transit users) (External Interface)
Tailored Trip Itinerary	consists of all information about a user's specific trup and mode(s) including route (w/map), directions, schedule (and date) information, information about estination point(s) and points of interest, etc.	Traveler Services information (Service)